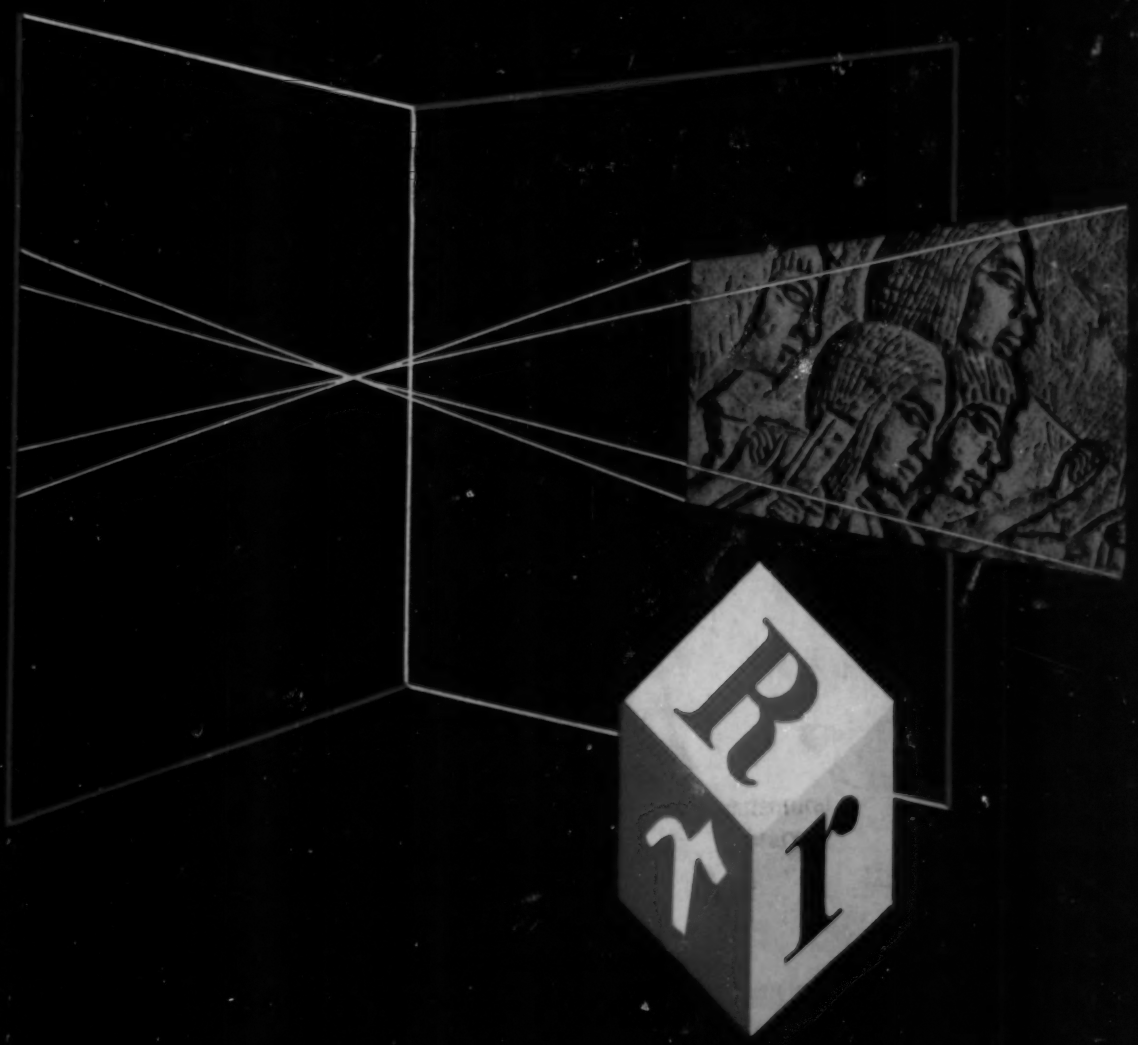
ARCHITECTURAL RECORD



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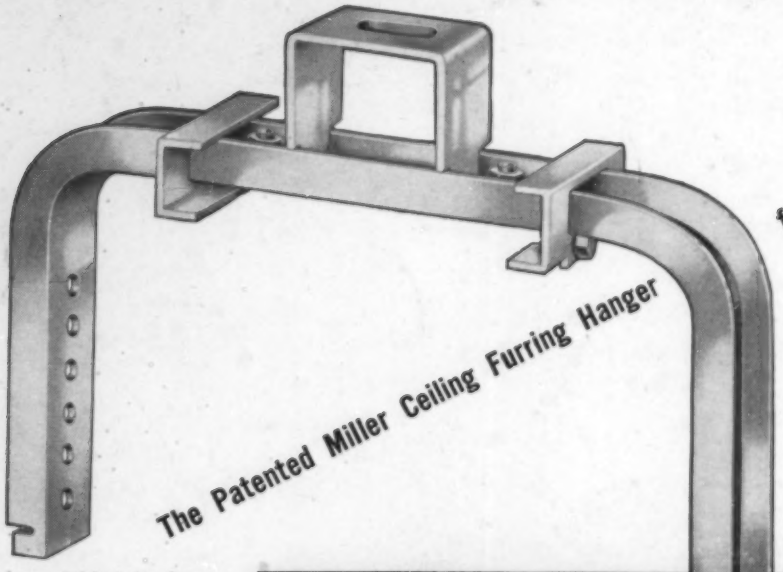

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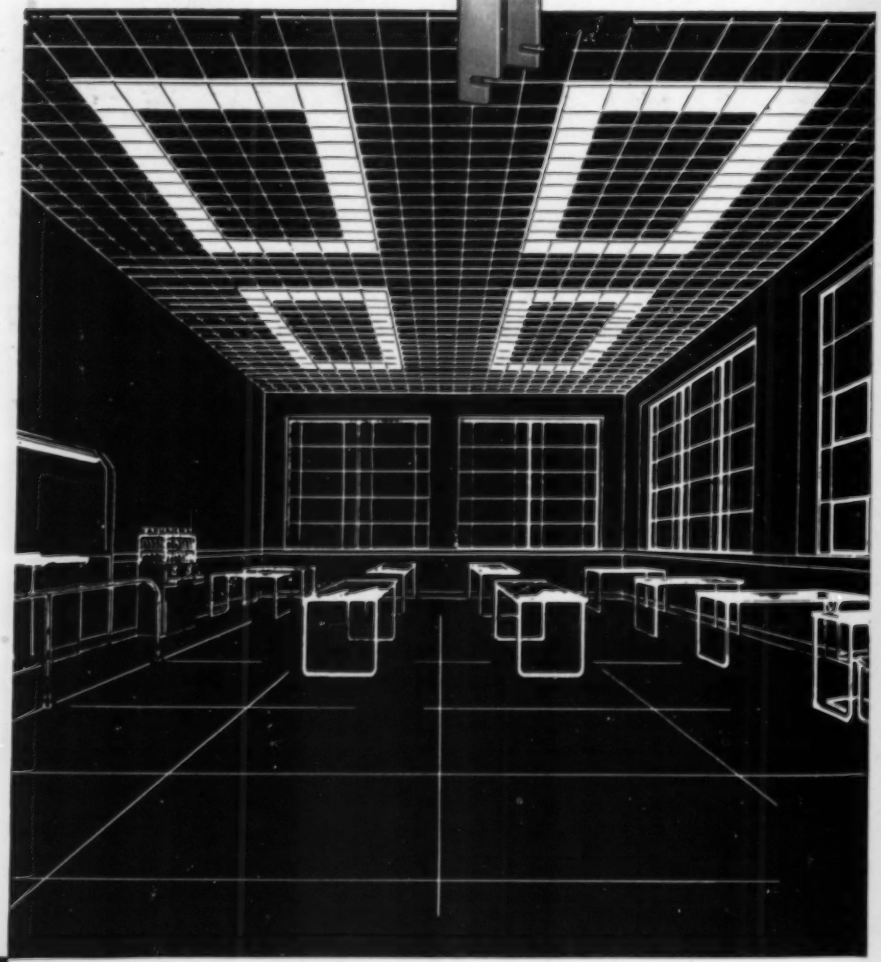

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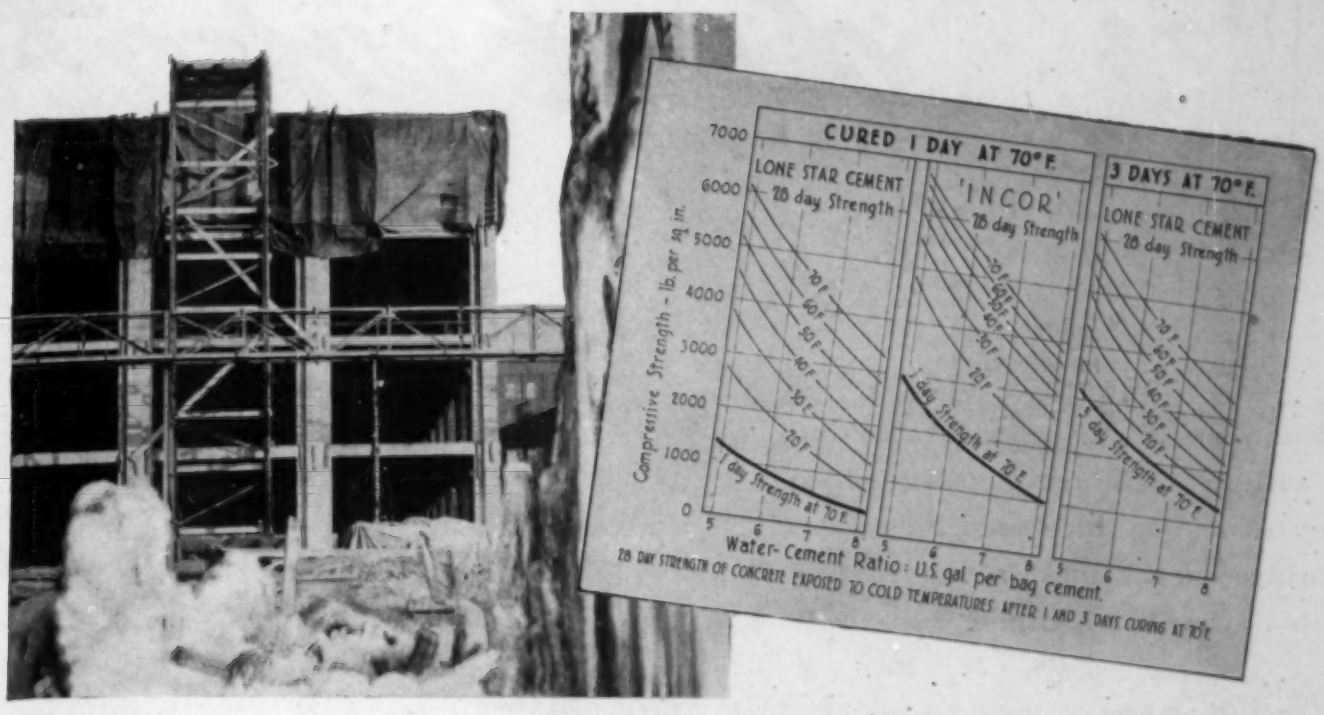

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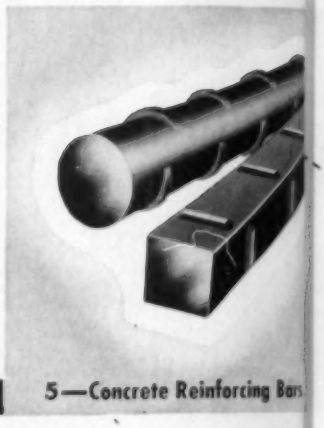
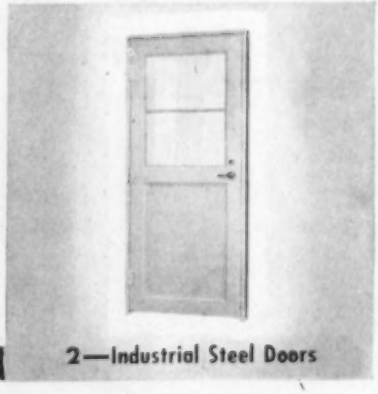


5—Concrete Reinforcing Bars



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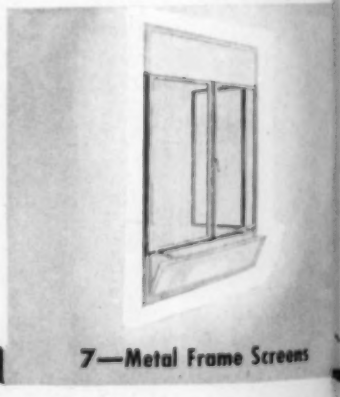

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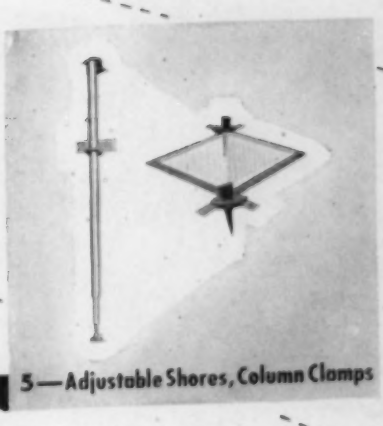

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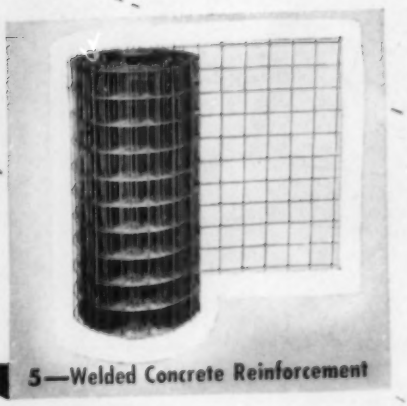

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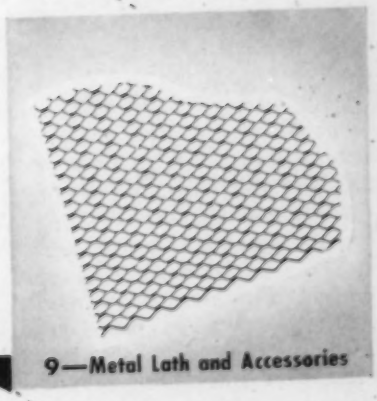

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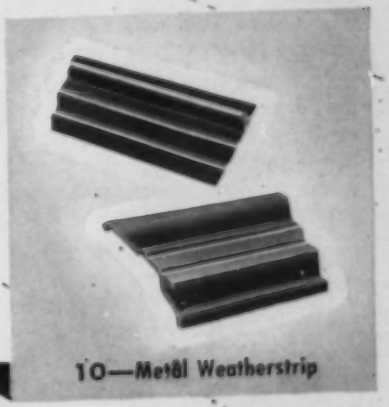

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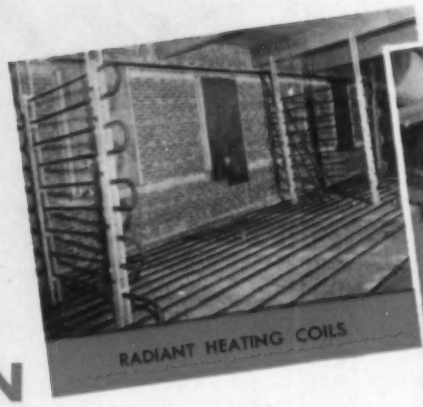
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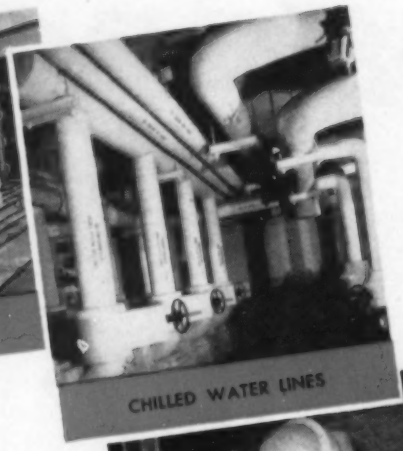
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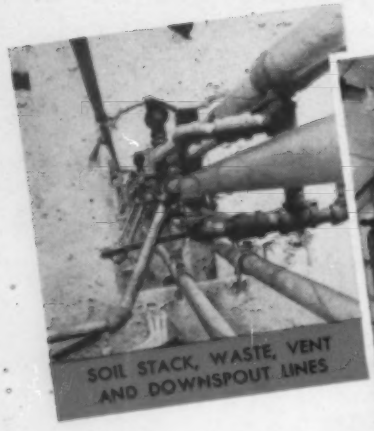
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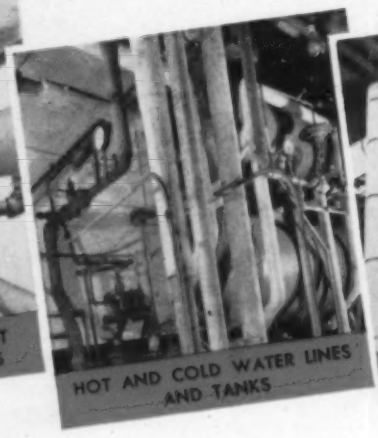
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ARCHITECTURAL RECORD

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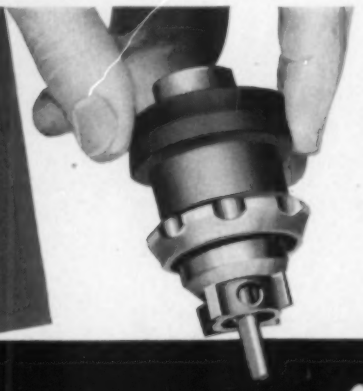
LE CORBUSIER

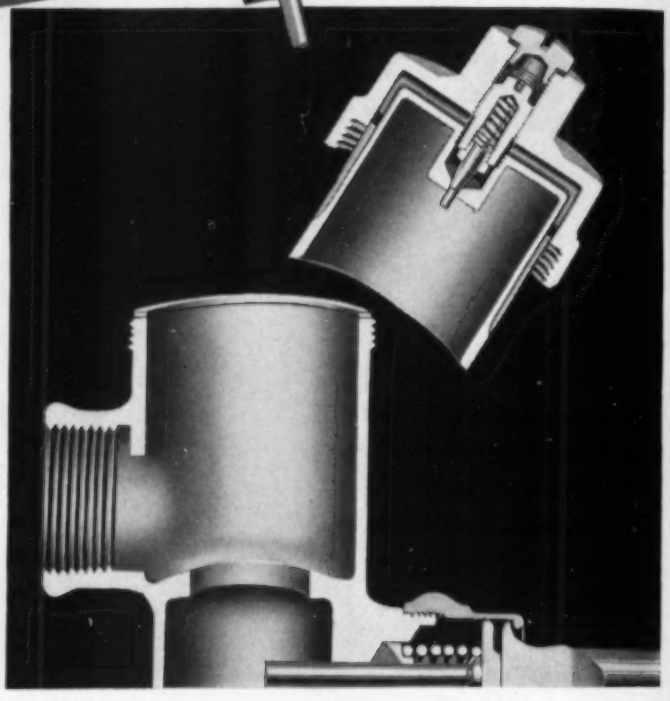
symbolizes FRANCE RESURGENT in his cover design for Architectural Record for March, to be followed by his own report of the great reconstruction projects which may well mark the climax of a great career in architecture

All Watrous Flush Valves provide

SINGLE-STEP-SERVICING

the feature that cuts maintenance time to a minimum





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THE IMPERIAL BRASS MFG. CO., 1240 W. Harrison St., Chicago 7, Ill.

HOW WATROUS SINGLE-STEP-SERVICING WORKS

Illustration above shows how the entire operating unit of a Watrous Piston-Type Flush Valve lifts out. Repairs can be made in a jiffy by simply replacing this unit.

Note that the main seat washer is attached right to the operating unit. Thus, with Watrous Flush Valves there is no need to dig around inside the valve to remove an old washer—no need to work at length in confined quarters. Servicing that might easily take 20 or 25 minutes is done in a few minutes on a Watrous Flush Valve.

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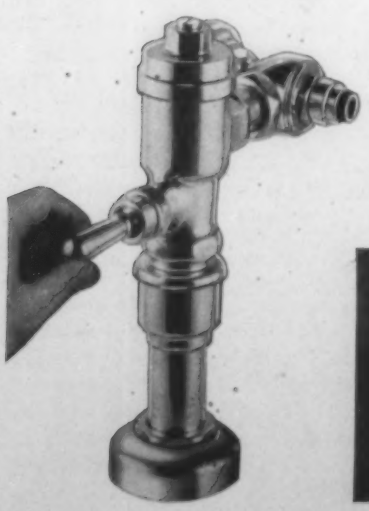
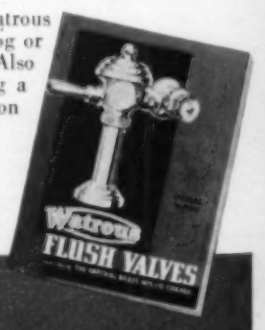


It will pay you to check up on the many Watrous points of superiority before you select flush valves for that next job.

For complete information on Watrous Flush Valves see Sweet's Catalog or write for Catalog No. 448-A. Also ask for Bulletin No. 477 giving a summary of "Architects' Views on Flush Valve Applications."



THEY PAY FOR THEMSELVES IN THE WATER THEY SAVE

Watrous Flush Valves

THE RECORD REPORTS

Uncle Sam Worries Over Housing • Housing Legislation Is Debated • Building Priorities Return • Housing Expediter Is Named • Housing Conferences Are Called

Uncle Sam is spending many sleepless nights in these last weeks of winter worrying over housing, particularly housing for veterans. He has tried hard but he can't see in the first full year of peace ahead how to get enough homes even for returned servicemen, let alone everybody. There will be a crying need into the second year of peace — and longer.

No matter how he figures, he still comes up with a headache. He notes that:

1. Congress has hurried through special funds for converting temporary war housing to immediate needs of veterans;
2. It is fashioning a long-time housing bill and threshing out methods to keep real estate prices down;
3. The Administration, in turn, has re-invoked priorities, sought to channel materials into low-cost homes, and installed a Housing Expediter, Wilson W. Wyatt;
4. It has sponsored a conference of industry, labor and government representatives on housing production;
5. It is keeping its eye cocked on bottlenecks in building from logging labor to plumbing fixtures, and on the distribution of materials for homes, for industrial and commercial expansion, and for maintenance and repair.

But no one sees any single, quick solution to the shortage of dwellings.

Housing Veterans

The Congressional move to reconvert war housing is sizable, entailing $191,900,000. Regional offices of the Federal Public Housing Authority are aiding state and local governments and educational institutions in getting hold of surplus federal structures suitable for veterans and their families.

FPHA Commissioner Klutznick warns, however, that the government surplus available for re-use is relatively small and "should be directed to meet only the most acute situations." Among items available are temporary family dwellings, trailers and other portable units, temporary dormitory buildings, military barracks, mess halls, etc.

Under the appropriation FPHA may dismantle the housing, ship it and re-erect it on the new site, restore the former site to its original condition, install foundations, extend sidewalks to the houses, and extend utilities from street mains to the houses.

Chief expenses of localities are those involved in providing a suitable site, installing streets and utility lines where necessary, and management and maintenance expenses, including taxes or payments in lieu of taxes. In addition to the 100,000 dwelling units that can be financed under the new appropriation, local bodies may continue to acquire other surplus housing facilities under regulations of the Surplus Property Administration.

Note that Surplus Property Administrator Symington, before 1946 rolled in, authorized federal agencies to turn over immediately and without charge any surplus housing or property adaptable to housing to state or local governments for rental to veterans. This made it possible for the Army and Navy, for instance, to make barracks and other buildings available as soon as the Armed Forces vacated them.

Legislation Debated

A few additional lights were thrown on the Wagner-Ellender-Taft comprehensive housing bill as its study continued in Congress. Lewis Douglas, president of the Mutual Life Insurance Company of New York, told the Senate Committee that the reduced interest rate would not appreciably reduce the cost of housing but would increase life insurance costs of 27,000,000 families because of the lower interest rates that life insurance companies would then receive on mortgages and other investments. The crux of the housing problem, Mr. Douglas said, is the cost of the land and materials, and the unit cost of labor.

Serious questions about loans on farm houses were raised by Clinton P. Anderson, the Secretary of Agriculture, who advocated limiting credit under the legislation "to those farmers who are unable to obtain cooperative or private credit on the customary basis." The government guarantee of loans provided in the bill, he said, would seriously weaken the cooperative credit system. "Additional credit sources of this character would not help appreciably in solving the rural housing problem," he added.

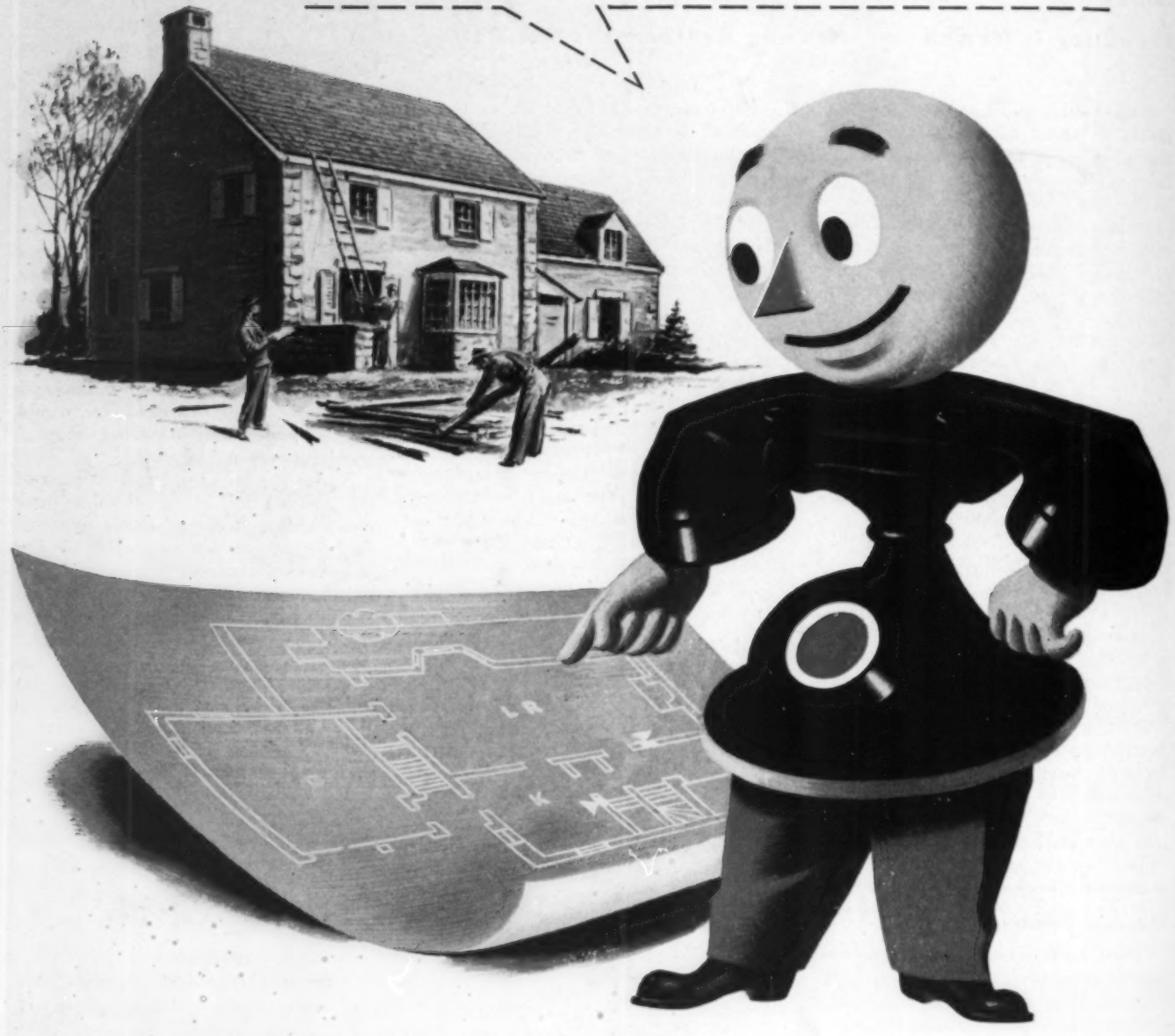
"Since the broad, general purpose of the housing bill is to stimulate new construction; it seems wholly unnecessary for this section to provide for the insurance of loans merely for the purpose of refinancing existing loans on farms on which buildings are located, or which would not involve new construction," Mr. Anderson advised further.

Meanwhile, a host of pros and cons were bruited about on the issue of federal

(*Continued on page 10*)

"They suggest we turn in the mechanical core of our house for a 1947!"
—Drawn for the RECORD by Alan Dunn

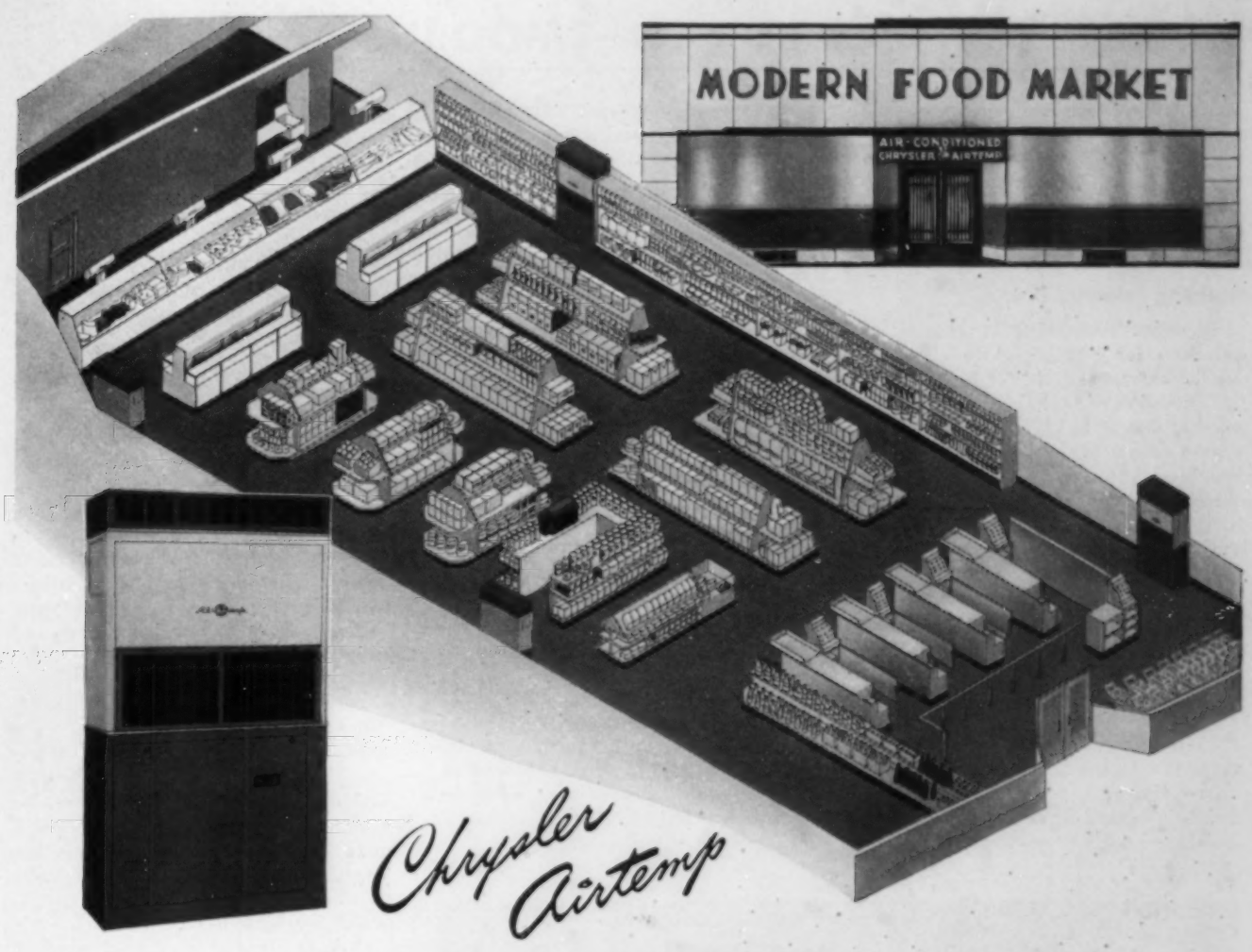
"Telephone outlets, too! That shows good planning"



Even though some people are still waiting for telephones, alert architects and builders are not forgetting to plan for the days when they'll be available without stint. Built-in telephone facilities—with conduit concealed out of sight in the walls and neat outlets all ready for connection—add much to a house at little cost.

They avoid exposed wiring; make it easy for the home owner to have telephones wherever he'll need them—living room, bedroom, hall, kitchen or other convenient locations. Every modern home should have built-in telephone facilities. Your telephone company will be glad to help you plan a good telephone layout for any residence.

BELL TELEPHONE SYSTEM



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For a modern super store like the one above, or a small shop—"Packaged" Air Conditioners, pioneered by Chrysler Airtemp, are a solid investment for increasing patronage and profits. Compact, easy to install, they fit readily into any store plan. Their time-tested dependability has brought coast-to-coast acceptance by business and professional men.

"Packaged" Air Conditioners can be installed singly or in multiple, and can be converted into year 'round air conditioners by the addition of a heating coil. Because they are completely packaged, they come ready to go to work and immediately begin paying for themselves. The sealed Radial Compressor is engineered for long, trouble-free life; noted for quiet, low-cost operation and exceptionally low upkeep.

It's good business for any architect to include this modern, simplified form of air conditioning in plans for new stores, shops, clinics, doctor's or dentist's offices, hotels, or even for new homes—the Chrysler Airtemp "Packaged" Air Conditioner also operates in combination with a warm air central heating system. Airtemp Division, Chrysler Corp., Dayton 1, O. In Canada, Therm-O-Rite Products, Ltd., Toronto.

Invest in Your Future—Buy U. S. Savings Bonds! "REMEMBER THURSDAY NIGHT! The music of Andre Kostelanetz and the musical world's most popular stars—Thursday, CBS, 9:00 P.M., E.S.T.

CHRYSLER AIRTEMP

HEATING • COOLING • REFRIGERATION

 (*Continued from page 7*)

controls over housing prices with the Patman bill (to create an Office of Housing Stabilization) as the focal point in the argument. Reconversion Director Snyder was among those putting his stamp of approval on ceiling prices for the sale of old and new housing.

Building Priorities Return

President Truman's reinstatement of priorities for building materials came on the recommendation of Mr. Snyder.

"Diversion of materials," the Reconversion Boss told his Chief, "from less urgent commercial and industrial construction and from high-cost housing through such a priority system is one of the few ways in which we can immediately increase the supply of home-building materials."

While some building trade groups gave approval to the priority plan, they opposed the application of rigid price ceilings.

The priority program became effective January 15 and was applied through Priorities Regulation 33 under the Civilian Production Administration. It sets up an HH rating for 10 housing materials in critical short supply: common and face brick, clay sewer pipe, structural tile, gypsum board, gypsum lath, cast iron soil pipe and fittings, cast iron radiation, bathtubs, lumber, and millwork. Such ratings are available to veterans or to builders who will give preference to veterans either in sale or rental. Top price allowed is $10,000 and top rental $80 per month.

These qualifications are of interest:

1. FHA must be satisfied that the proposed price or rent is reasonably related to the proposed accommodations.

2. Applicants must show that they will be ready to start construction within sixty days. If construction has not been started within sixty days, the HH rating becomes void and a new application must be filed.

Expediter Named

To speed up his whole program on new homes, Mr. Truman called on Wilson W. Wyatt, of Louisville, Ky. By letter he told the Kentuckian:

"It is urgent that every available temporary living quarter be used in over-crowded communities, that the production of building materials be expedited, that the production of homes be hurried, that the cost of housing be protected from further inflation."

Specifically as to his duties, the President informed the Expediter:

"I am asking you to search out all bottlenecks at whatever level of industry or of government — local, state or national — you may find them; to try to break those bottlenecks; and to make the machinery of housing production run as smoothly and speedily as possible."

Mr. Wyatt, born in Louisville in 1905, practiced law until he ran for the post as mayor of the city in 1941, and had a hand in Kentucky's urban rehabilitation law for the redevelopment of blighted neighborhoods.

Conferences Called

As one part of its expediting program, the federal government called the December conference on housing production to be followed later by a conference of leaders in the home financing field to combat inflation and a third conference of public interest groups to get support of the production and inflation control programs.

In the course of the first conference pertinent points were brought out. Civilian Production Administrator John D. Small made clear that during the war many builders discontinued operation and disbanded their organizations. "It takes time to reorganize a widely dispersed, highly diversified industry like construction, in which so many different factors and operations require integration," he pointed out.

Among other of Small's points:

". . . shortages of certain materials will, quite frequently, not hold up the building of houses if available substitutes are used. For example, where lumber is short, concrete blocks may be available. In this period of acute shortages, if we are to get a maximum number of houses built, we cannot each have exactly what we want. The builders cannot build exactly what they would like to build.

". . . where the community itself can, and I think should, help out in the acute housing situation, is in the granting of building permits . . . an undue and unwarranted drain on scarce building materials for use in building night clubs, and juke joints, and roadside stands, and on deferrable repairs or extensions to existing buildings can be controlled to a very substantial degree through the building permit system."

L. C. Hart, president of the Producers' Council, Inc., presented the results of surveys by his organization showing that "pricing, manpower *at work* and raw material problems have become dominant factors in the situation." Mr. Hart went on to say that "the real bottlenecks, according to our latest survey, are millwork, enameled plumbing fixtures, steam, hot water and

(*Continued on page 13*)

British Combine

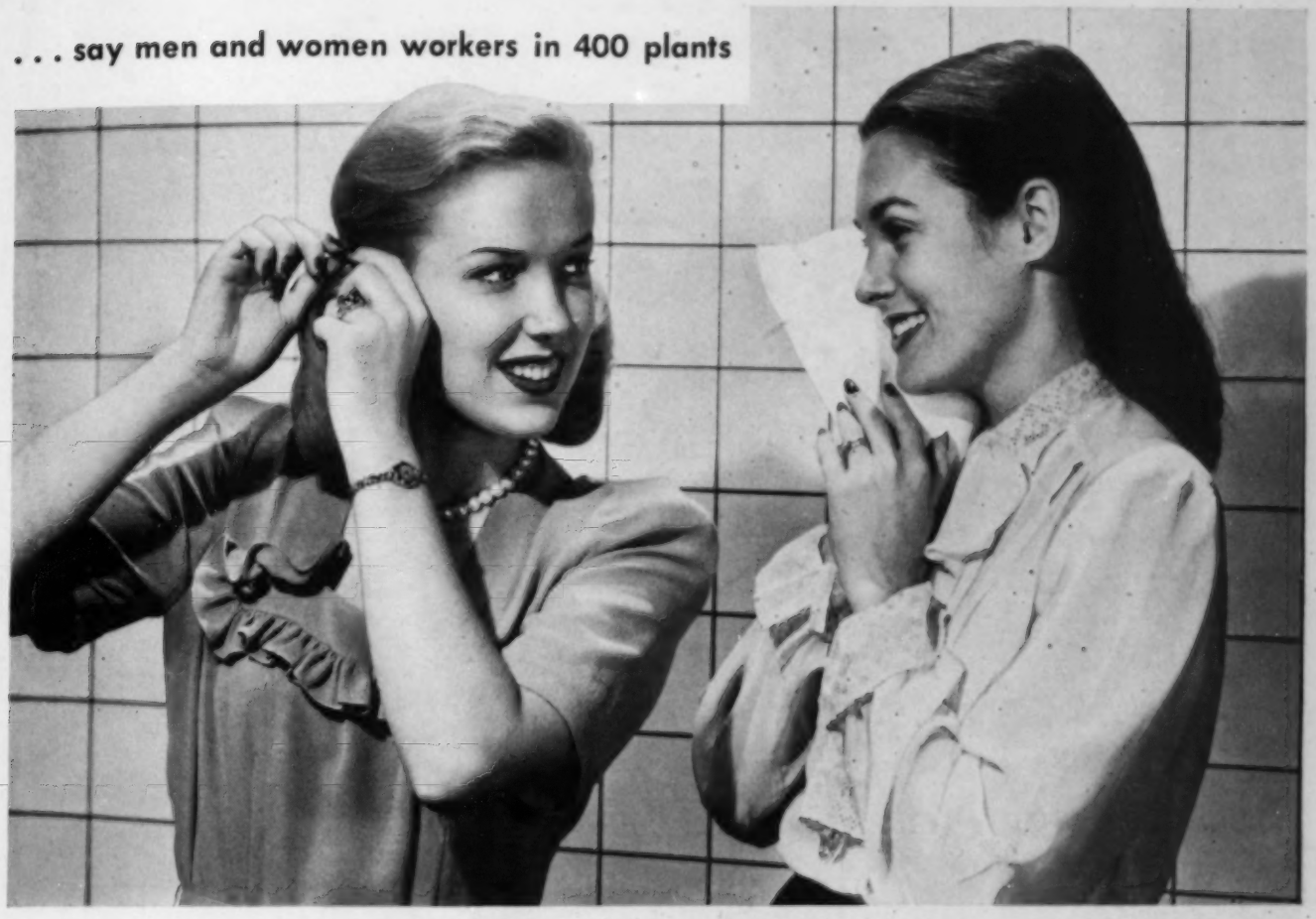
Model of the proposed rebuilding plan of Coventry, England. The Cathedral is to the left

A NEW COVENTRY

Bomb-leveled Coventry, England, is going ahead rapidly with plans for rebuilding. As City Architect D. E. E. Gibson works on his plans, a Northampton model manufacturing firm, Bassett-Lowke, makes small-scale models which are laid out on a miniature representation of the city's blitzed area. The photo above shows how much progress already has been made.

GOOD WASHROOMS—one of the "Big 4" in good working conditions

. . . say men and women workers in 400 plants



JANE: "No 'two ways about it' with this company. Our washrooms are just as bright and tidy as the 'front office' ones."

DORIS: "It makes a big difference, doesn't it, to be able to clean up in a washroom that's as pleasant as your own bathroom at home."

WORKERS FROM COAST TO COAST—in a special research study—ranked good washrooms right along with safety devices, adequate lighting and proper ventilation as the "Big 4" factors in good working conditions.

Modern, sanitary washrooms, complete with plenty of hot water, soap and good quality individual paper towels, help keep workers happy. Moreover, they help keep germs from spreading by encouraging thorough washing. This, in turn, helps reduce the number of absences due to colds and their more serious complications.

Haven't you yourself been irritated by a poorly planned, badly equipped washroom? Then make sure your washrooms are designed to be "Health Zones," not "Germ Exchanges"—"morale-boosters," not "temper-testers."

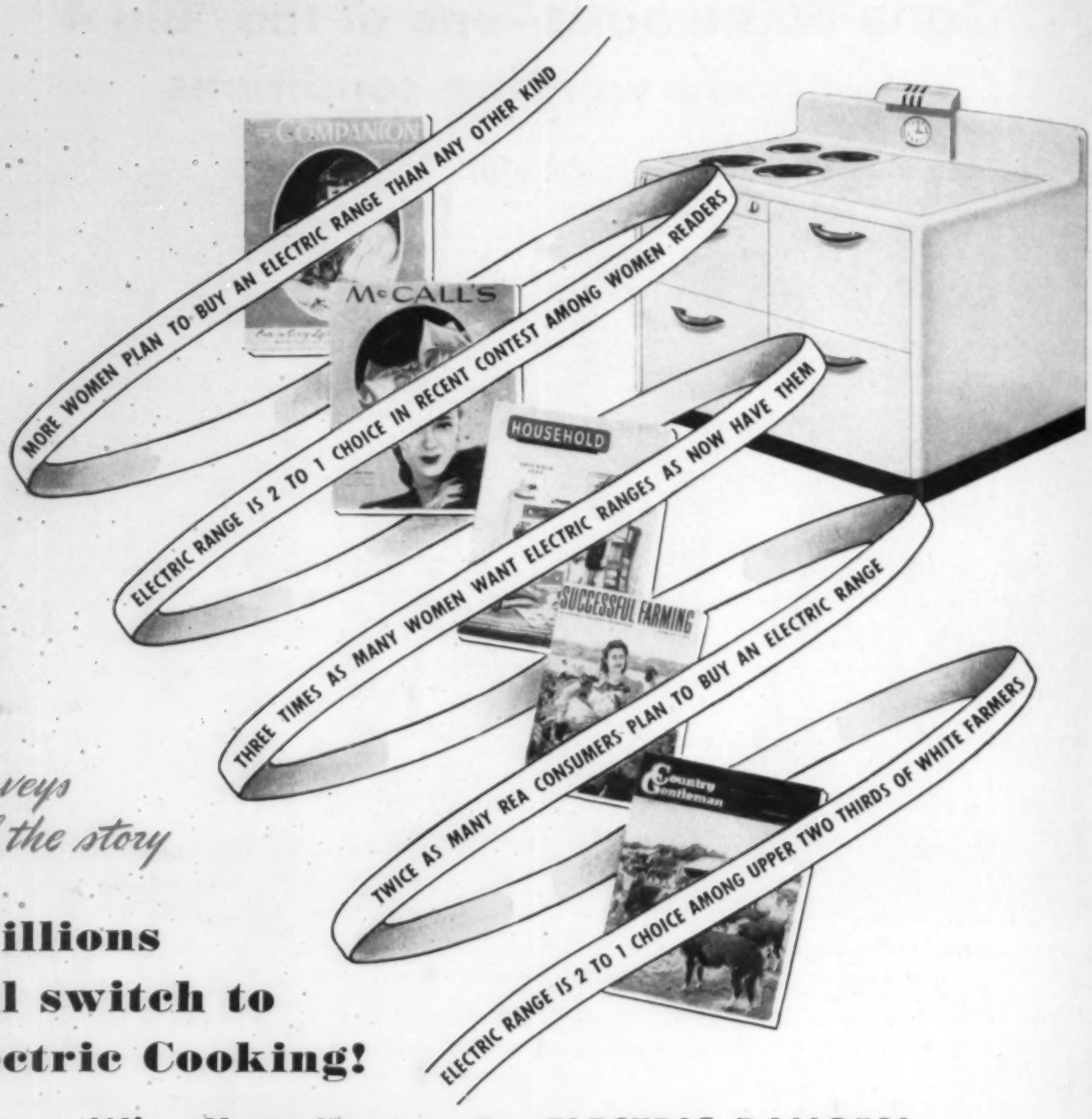
Good Washrooms begin at the Drawing Board

Efficient, well-equipped washrooms that help keep workers healthy and happy are a result of careful thinking and planning in the blueprint stage. For practical suggestions on modern washroom layout, turn to our four pages in Sweet's catalog—or call on the Scott Washroom Advisory Service, Scott Paper Company, Chester, Pennsylvania

SCOTTISSUE TOWELS STAY TOUGH WHEN WET

Thirsty Fibre

Trade Marks "ScotTissue," "Washroom Advisory Service" Reg. U.S. Pat. Off.


MORE WOMEN PLAN TO BUY AN ELECTRIC RANGE THAN ANY OTHER KIND
ELECTRIC RANGE IS 2 TO 1 CHOICE IN RECENT CONTEST AMONG WOMEN READERS
THREE TIMES AS MANY WOMEN WANT ELECTRIC RANGES AS NOW HAVE THEM
TWICE AS MANY REA CONSUMERS PLAN TO BUY AN ELECTRIC RANGE
ELECTRIC RANGE IS 2 TO 1 CHOICE AMONG UPPER TWO THIRDS OF WHITE FARMERS
COMPANION
McCALL'S
HOUSEHOLD
SUCCESSFUL FARMING
Country Gentleman

Surveys tell the story

Millions will switch to Electric Cooking!

Wire Your Houses For ELECTRIC RANGES!

The trend is unmistakable. In survey after survey, American housewives have expressed their preference for the convenience, cleanliness, dependability and economy of modern electric cooking.

Among the many unbiased surveys which show the strong swing to Electric Cooking are those made by leading national magazines, such as *Woman's Home Companion, *McCall's, *Household, *Successful Farming and *Country Gentleman.

And prewar sales figures further emphasize the swing to electric cooking. Between 1933 and 1941, sales of electric ranges increased *over 900 per cent.*

You can cash in on this preference and give the houses you build an added selling feature by wiring your homes for electric ranges. Built-in, the cost is negligible—the selling power tremendous.

Electric Range Section, National Electrical Manufacturers Association
155 E. 44th Street, New York 17, N. Y.

A-B STOVES • ADMIRAL • ELECTROMASTER • ESTATE HEATROLA • FRIGIDAIRE • GENERAL ELECTRIC • GIBSON • HOTPOINT • KELVINATOR • MONARCH • NORGE • QUALITY • UNIVERSAL • WESTINGHOUSE

FOR EASIER SALES

wire your houses

FOR ELECTRIC RANGES

(*Continued from page 10*)

warm air heating equipment, and possibly cast iron soil pipe. These are the items which will be in short supply, unless something drastic is done. These are the bottlenecks which threaten to control the number of new homes built next year."

OPA Shifts Prices

Aside from continued pressure for controls over housing prices, the Office of Price Administration has been moving otherwise in the field of construction. In December it established a new pricing method to enable producers of certain building materials to ship outside their normal marketing areas into temporary shortage areas. Producers were authorized to add the full amount of freight costs to the f.o.b. plant maximum prices of their product. First material granted this right was crude gypsum "when sold for use as a retarder in the manufacture of cement."

OPA also has upped by 20 cents a barrel the manufacturers' maximum prices for all types of Portland cement except white in various midwestern states: Nebraska, Kansas, Oklahoma, Arkansas, western Missouri, Idaho, Montana, Wyoming, Utah, Colorado and New Mexico. It increased by approximately 9.7 per cent the ceiling prices for vitrified clay sewer pipe in eastern and east central states.

NHA and FHA Act

Two other notes of interest in the housing field stem from the National Housing Administration and the Federal Housing Administration. NHA is pressing the conversion of single into two or more family houses, and is giving priorities assistance to contractors; in this connection, FHA will insure improvement loans (up to $5,000 for seven years) if the property is in a war housing area, if improvements provide new living accommodations, and if veterans get occupancy priority.

Generally in its insurance of mortgages, FHA will allow appraisals about 30 per cent above prewar values. The more liberal policy is expected to apply particularly to new building which, in 1946, will consist mainly of homes built under the new CPA priorities. It is due to apply also when old homes are transferred.

Commerce Offers Program

Under Secretary of Commerce Alfred Schindler has brought forth a "four-point reform program" for building industry and labor. He cites four cost obstacles obstructing the building industry and says that they must be removed. He lists them as follows:

1. The lack of effective price control on land values, on construction and on finished houses.

2. The lack of year 'round work and an assured basic annual wage for workers in the industry.

3. The oppressive and restrictive practices now being carried on by some construction industry suppliers, and the restrictive agreements between management and labor in the construction field.

4. The continuance by most of our municipalities of antiquated building codes, which restrict the use of new and cheaper materials and in many other ways add to the cost of construction.

Mr. Schindler advises the adoption, with minor local variations, of a uniform national building code based upon tests by the National Bureau of Standards.

Proposed home office for John Hancock Co.

NEW BUILDINGS PLANNED

Insurance Headquarters

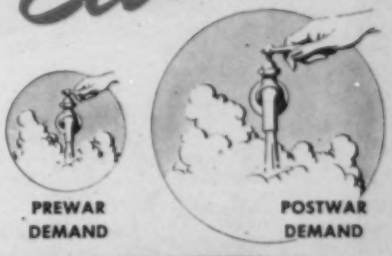
Construction will be begun at once on the first postwar business building in Boston, Mass. — the new 26-story home office of the John Hancock Mutual Life Insurance Co.

The new building, 417 ft. in height, will occupy a site 290 by 270 ft. east of the company's present home office, bounded by Berkeley and Stuart Streets and St. James Avenue. The site is now vacant except for the present John Hancock Hall, which will be razed; a new hall, designed to seat 1100 people and fully equipped as an auditorium, will be included in the Stuart Street wing of the new building.

The $15,000,000 structure, designed to provide the maximum floor space possible for the dimensions of the lot, will provide, exclusive of the space for elevators and other mechanical equipment, almost 625,000 sq. ft. of working space.

(*Continued on page 14*)

WATER HEATING
is going
Electric!



Postwar Sales Will Triple Again

In the 6 prewar years, sales of Electric Water Heaters almost tripled. And a 1944 survey made for NEMA* shows that *three times* as many women *want* Electric Water Heaters as now have them! They're "what women want," because they're:

SAFE—Flameless, fumeless.

CLEAN—Smokeless, sootless.

ADAPTABLE—Permit short hot water lines—Require no flue or vent.

TROUBLE-FREE as electric light!

ECONOMICAL—The cost is low for plenty of hot water all the time.

Installing Electric Water Heaters in every house you build, means giving women *what they want!*

* Electric Water Heater Section
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

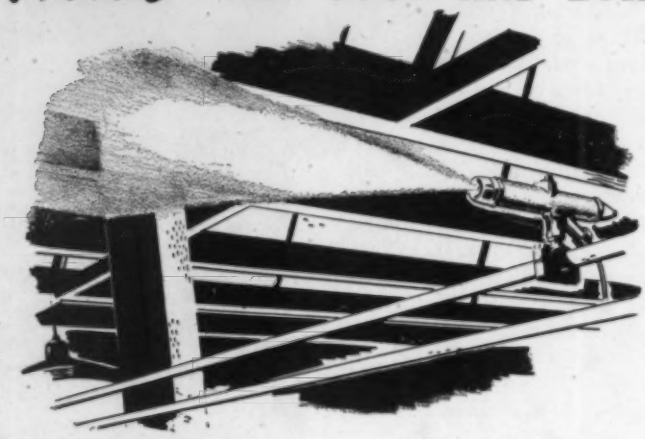
ADMIRAL · B & F · CLARK · ELECTROMASTER · FOWLER · FRIGIDAIRE · GENERAL ELECTRIC · HOTPOINT · HOTSTREAM · KELVINATOR · MONARCH · NORGE · PEMCO · REX · RHEEM · SELECTRIC · SMITHWAY · THERMOGRAY · THERMO-WATT · UNIVERSAL · WESTINGHOUSE

A House Wired For An Electric Range Is Already Wired For An

Electric

WATER HEATER!

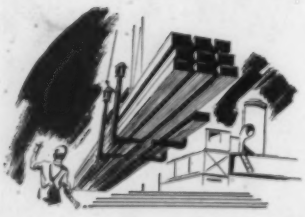
Mist FOR GOOD AND EVIL



Mist, sprayed in process plants requiring high humidity, is vital to the quality of many products. But, it raises havoc with the wood structures. And steam and chemical-laden vapors in wet process plants cause ordinary lumber to go to pieces in a hurry.

Wolmanized Lumber*, wood that's impregnated with Wolman Salts* preservative, is highly resistant to the decay that inevitably develops in these humid atmospheres. Fibre-fixation prevents its washing out or leaching, assures added years of service life.

The Advantages of Building with Wood



Building with wood means ease and speed of erection, light weight, resilience, high insulating value, paintability, low first cost and . . . when Wolmanized . . . long life.

*Registered trademarks

1679 McCORMICK BUILDING, CHICAGO 4, ILLINOIS

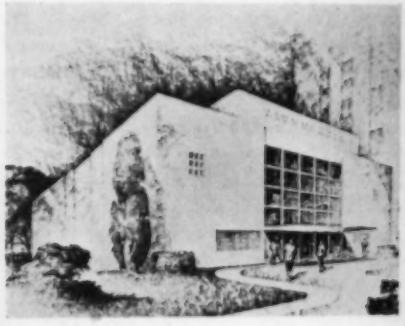
THE RECORD REPORTS

(*Continued from page 13*)

The exterior shell of the building will consist of a 26-story central structure, fronting on Berkeley Street, flanked by two 7-story wings and topped by a lantern tower. It will be simple in style, faced with stone, its sole ornamentation a colonnade across the center portion of the main Berkeley Street entrance.

The interior of the building will be marked by two main characteristics: large unobstructed working areas; and new standards of comfort. The architectural design will provide open work areas 50 ft. wide and 250 ft. long on both flanks of the building in the lower block. All interior partitions will be of the movable steel type.

Spacious lunch rooms and a completely equipped kitchen will make it possible to serve 4,000 employees in four sittings. One entire floor will be devoted to rest and recreation facilities. Cram and Ferguson of Boston, are the architects; Turner Construction Co., contractors.



Auditorium for N.Y.U.'s medical center

Alumni Hall

Plans have been announced for another of the group of buildings forming the new New York University-Bellevue Hospital Medical Center on New York's east side. This is Alumni Hall, an auditorium building adjoining the previously announced Residence Hall (see AR, Dec., 1945, p. 144). The ground floor of the building will contain the assembly hall with a seating capacity of 500, a large lobby, vestibule, and the offices for the Alumni Association of the College of Medicine. The mezzanine floor will contain a conference room and foyer, a balcony, and a projection room.

Newspaper Plant

Housing four industries — newspaper, gravure, radio and television broadcasting — the new home of the *Louisville* (Ky.) *Courier-Journal* and *Louisville Times* will have about 250,000 sq. ft. of air conditioned floor space.

The project was designed by Lockwood-Greene Engineers, Inc., of New

(*Continued on page 16*)

A PROFITABLE FIELD

for Architect and Builder!

— stimulated by the new Kawneer Program!

LEADING ARCHITECTS AND BUILDERS throughout the nation are becoming more and more interested in the store-front field, which is definitely due for tremendous activity in the years ahead.

The demand for architectural and design services with stores is growing every day. Retail merchants now recognize that proper planning and design create extra selling power. The new Kawneer program, reaching hundreds of thousands of retail merchants in every trade, is accelerating this national trend.

Kawneer Store-Fronts—"Machines For Selling"—are being promoted with special emphasis on the importance of the function of good design.

You can tie into this national campaign, obtain valuable help from Kawneer field men, create more effective fronts with new Kawneer products. *WRITE The Kawneer Company, 400 Front St., Niles, Michigan, for ADDITIONAL DATA ON THE KAWNEER PLAN.*

Kawneer
STORE-FRONTS

MACHINES FOR SELLING!

Neither sun, rain nor the storms of winter mar the appearance of this fashionable brick residence in Grosse Pointe, Michigan. For it wears a handsome coat of portland-cement paint made with Atlas white cement.

This durable finish penetrates the pores in concrete masonry, brick, stone and hollow tile. It forms a tough outer skin that resists moisture, dirt and dust. Because it's so easy to clean, frequent repainting is unnecessary.

Portland-cement paint is easy to look at—easy to apply. The base of Atlas White cement assures beautiful, distinct color tones. And it comes in handy packages that are ready to mix with ordinary tap water on the job.

Atlas White Bureau, Universal Atlas Cement Company
(United States Steel Corporation Subsidiary),
Chrysler Building, New York 17, N. Y.

FACTORY-PREPARED PAINT IS PREFERABLE
SEE YOUR LOCAL PAINT DEALER

SUNDAY EVENINGS—*American Broadcasting Company (Blue) Network—*
U. S. Steel's "The Theatre Guild on the Air."

AR-P-10

A UNIVERSAL ATLAS PRODUCT

ATLAS WHITE CEMENT
FOR PORTLAND-CEMENT PAINT

THE RECORD REPORTS

(*Continued from page 14*)

Newspaper plant and radio station in one

York, with Joseph H. Kolbrook, architect, the local associate and owner's representative. It will consist of two units, a 6-story rectangular office building and a 4-story rectangular building for the newspaper's mechanical departments. The combined floor space of the two will be about 250,000 sq. ft., all of which will be air conditioned. There will be a 165 by 200 ft. parking area north of the plant.

The office building will be of steel construction with limestone facing; the mechanical departments' building will be of flat slab concrete. While the two will appear to be one structure, they will be structurally separate to keep printing press vibration from affecting the radio studios.

HOUSING SITUATION IS UNIMPROVED

Despite the constant stream of suggestions from all quarters on methods of alleviating the housing shortage, little or no action is being taken, and the situation definitely is not improving.

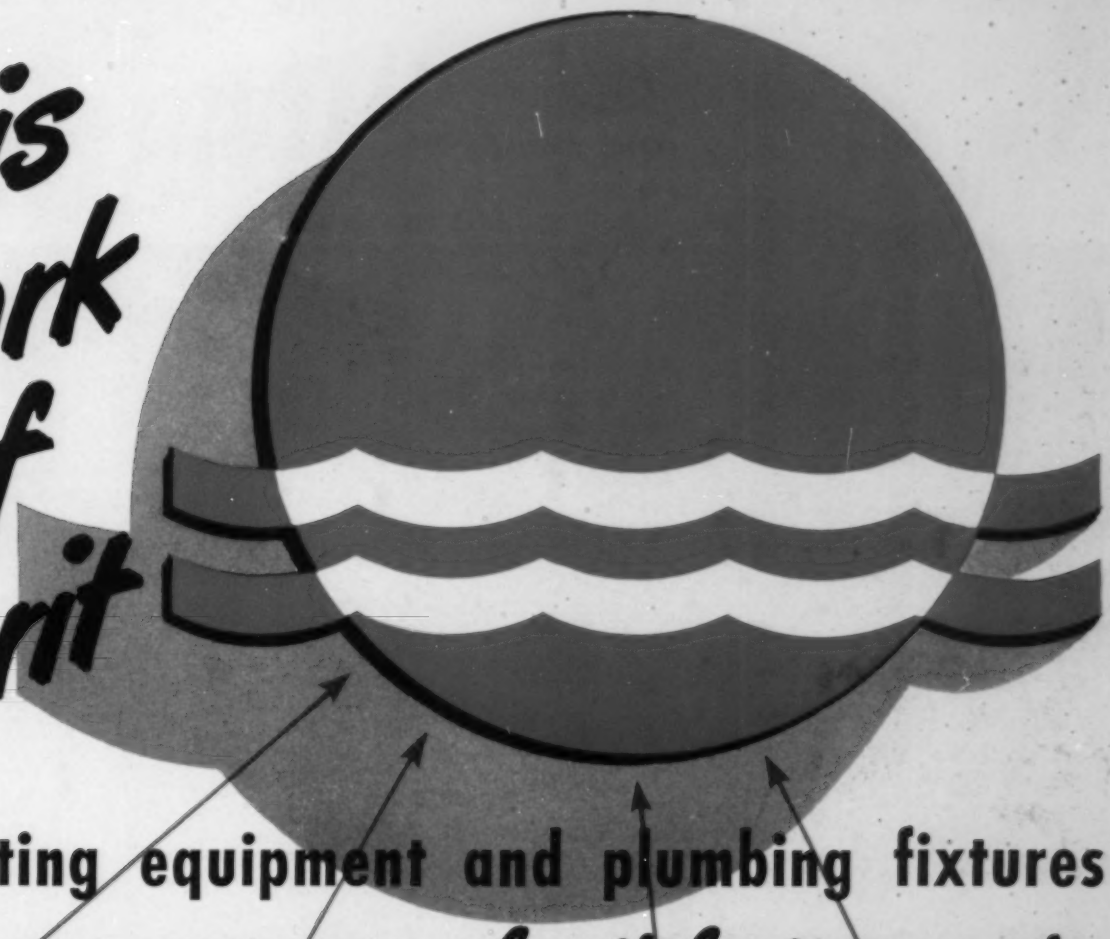
Typical of conditions in cities all over the country is Chicago, where the Housing Authority reports that because of the impossibility of finding new quarters for its "excess income" families, it is in the position of having to keep as tenants families no longer in the lowest income groups, while thousands of eligible families are inadequately housed or have no housing at all.

Encouraging, on the other hand, is the survey being made in New York and other cities, with the resulting discovery of hundreds of dwelling units at present unoccupied but readily convertible.

The New York City Housing Authority reports that four sites of future projects will be completely cleared by next May, and two more sufficiently cleared to enable construction work to start at that time. Relocation offices are being established on the future project sites to assist present tenants in finding apartments to which to move.

(*Continued on page 138*)

This Mark of Merit



on heating equipment and plumbing fixtures

...is your assurance of satisfactory service

THIS easily recognized Mark of Merit now is being extensively advertised to millions of homeowners and builders as the dependable guide to the best in heating equipment and plumbing fixtures.

Like the "Sterling" mark on silver, this Mark of Merit on heating equipment and plumbing fixtures stands for the very finest. It identifies time-tested, performance-proved products which are backed by many millions of dollars spent in research. Products which have been Serving the Nations' Health and Comfort for more than half a century.

Make certain of satisfaction by specifying American-Standard products. These products are styled, designed and engineered to fit the widest range of architectural and structural requirements.

For information, contact your Heating and Plumbing Contractor. **American Radiator & Standard Sanitary Corporation**, P. O. Box 1226, Pittsburgh 30, Pa.

AMERICAN-Standard

HEATING PLUMBING

Serving the Nations' Health and Comfort

and lands like a feather

It moves with the strength of an eagle and lands like a feather, closing doors gently but firmly . . . its reserve strength under perfect control, balanced and applied in a precision built, friction-free mechanism.

These Ball Bearing Door Closers are typical of the quality expressed in Lockwood Builders' Hardware. You can include them in your specifications for hotels, hospitals, schools and other buildings, confident they will live up to your own high standards.

L-1A

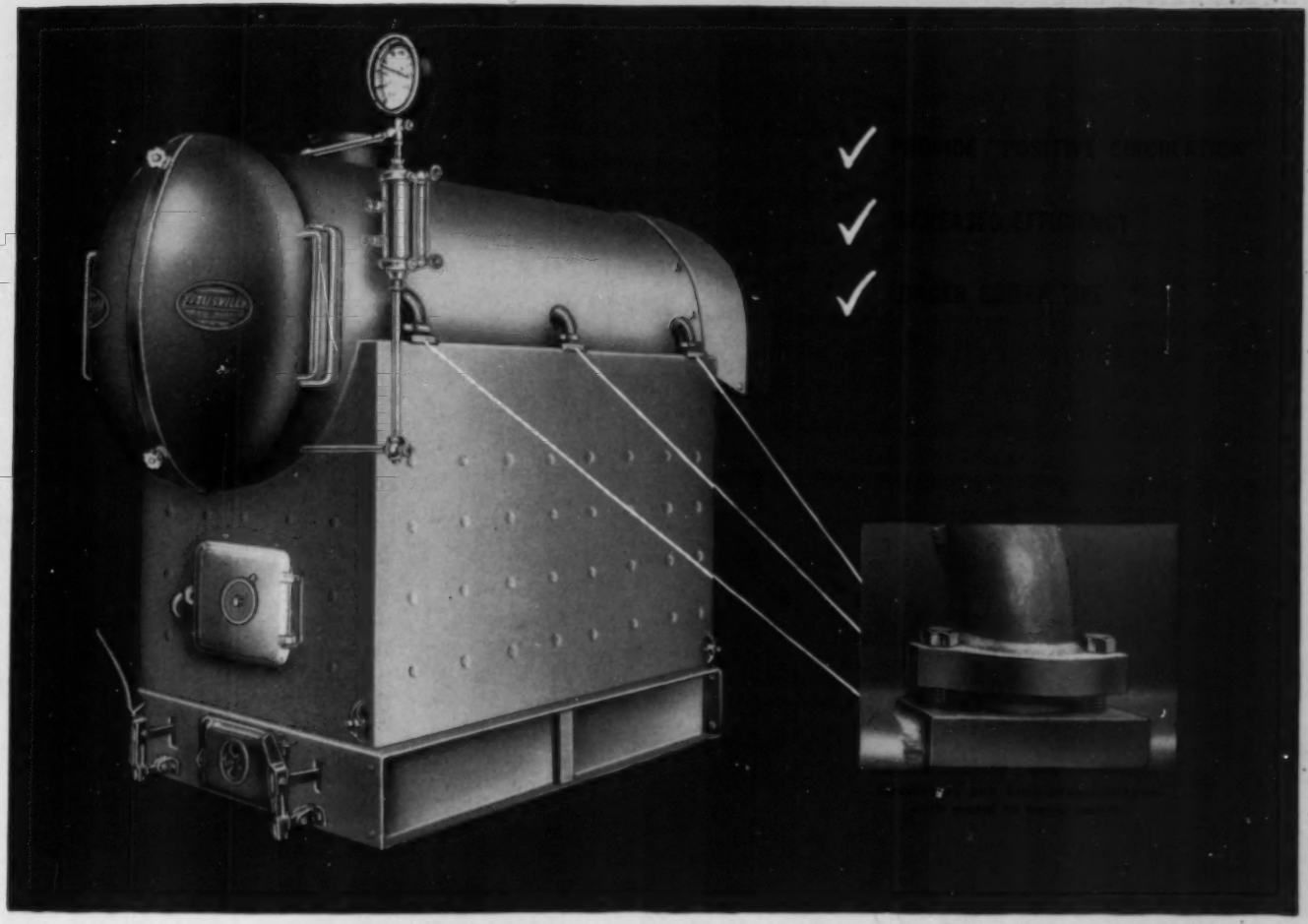
LOCKWOOD HARDWARE MANUFACTURING COMPANY
Division of Independent Lock Company • Fitchburg, Massachusetts

lockwood builders' hardware

TITUSVILLE

MODERN IMPROVED *Compact*

STEEL HEATING BOILERS



19 STANDARD SIZES IN
HAND OR MECHANICAL FIRED
USING ANY TYPE FUEL

Just as a pump on a forced hot water heating job steps up circulation and increases heating results, the *Side Circulators* in Titusville Compact Boilers assure *positive circulation.*

Titusville *Side Circulators* do the work of a pump —they restrict the openings between the firebox and shell and increase the velocity of the flow of steam and hot water within the boiler.

As a result, steam bubbles that accumulate on and insulate the heating surfaces are continuously washed off and a greater amount of heat is absorbed by the water in the boiler.

New Titusville Compact Boiler Bulletin on request.

TITUSVILLE
IRON WORKS CO
TITUSVILLE, PA.

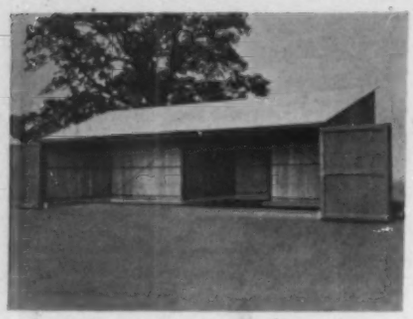
THE TITUSVILLE IRON WORKS COMPANY

Division of Struthers Wells Corporation

TITUSVILLE, PA.

District Representatives in Principal Cities

FOR BETTER BUILDING



All-metal prefabricated T-shaped hangar for single or multiple installations

SMALL HANGAR

An all metal prefabricated *Tee Hangar* recently announced is available for either single or multiple installations. Constructed of prefabricated structural members covered with corrugated sheets, the hangar is equipped with doors that jack-knife open to both sides far enough to make a full 38-ft. width for wingspread; the fuselage depth is 24 ft. Doors are of heavy, welded, tubular frame construction, operating on tracks welded to the structure. The hangar is T-shaped and arranged for a second unit to interlock with the first, using a common wall and trusses, and having alternate units opening on opposite sides. Where a grouping having all doors opening on one side is preferred, the hangar can be erected as a rectangle, the units placed side by side in line. The William Bayley Co., Springfield, Ohio.

BUILDING PLANS

Office and Warehouse

Ground was broken in December for the construction of a Frigidaire District Office and warehouse in North Kansas City. The new building will provide approximately 45,000 sq. ft. of office, storage, repair and sales space, will cost approximately $200,000. Construction is expected to take from 90 to 120 days.

Research Laboratories

The Standard Oil Co. of Indiana has announced plans for new research laboratories in Hammond, Ind., and work has been started on some of the buildings in the group. The main administration building, general laboratories, three pilot-plant buildings and a cafeteria are scheduled for immediate construction; an engine laboratory, a greenhouse for insecticide work, additional pilot-plant buildings and other research facilities will follow later.

Principal buildings in the group will be of light-gray brick, will be air conditioned throughout. The basic unit will be a two-man laboratory, with removable partitions to permit easy alteration to one-man laboratories or larger areas as desired. Holabird & Root, Chicago, are the architects.

Floor Space Trebled

Immediate trebling of floor space in its Kokomo, Ind., factory has been announced by the Pittsburgh Plate Glass Co. The plant fabricates Pittco storefront metal.

The expansion, expected to cost approximately $800,000, will increase floor space from 30,000 to 90,000 sq. ft., and will add facilities for the production of a new line of rolled shapes from aluminum sheet or strip. The Mahony-Troast Construction Co., Passaic, N. J., is engineer and building contractor.

Plant for Floor Tile

Work is to commence at once on a new one-story building, 427 by 127 ft., constructed of structural steel and cinder block, at the Kearny, N. J. plant of Congoleum-Nairn, Inc. The building will be used for the manufacture of asphalt floor tile. Epple and Kahrs of Newark are the architects and engineers, Turner Construction Co., contractors.

Plant for Washers

Immediate construction of a new Los Angeles plant has been announced by the Hurley Machine Division, Electric Household Utilities Corp., for the manufacture of Thor Automagic Washers.

Representing a possible $1,000,000 investment when fully developed, the new plant will be built on a 10-acre site in El Monte, a suburb of Los Angeles, will have a 600-ft. frontage and cover 170,000 sq. ft.

WINDOW PACKAGE

A factory fitted, three-way residential window "package" includes steel casement, storm sash and screen. Glass, wood casing, outside trim and hardware are provided as part of the package. Steel frames and ventilators are bonderized for protection against rust, dip-painted in a special primer, and oven baked.

Both storm sash and screen are factory fitted, and are installed from the inside. The storm sash opens in unison with the casement window. Detroit Steel Products Co., Detroit, Mich.

Hedrich-Blessing Studio

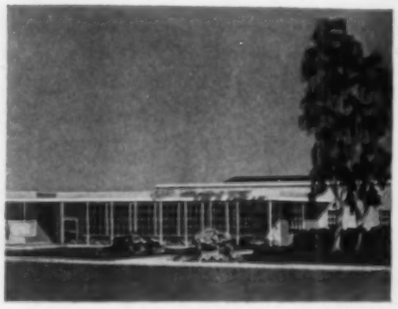
Standard Oil's new research laboratories

DUAL LAMP UNIT

A new electrical fixture for home use brings together into one unit the infrared heat lamp and the ultraviolet sunlamp.

Adaptable as a floor or table model lamp, and equipped with a two-way three-position switch by which the user may select the infrared or the ultraviolet at will, the new fixture, called the *Select-o-ray*, already is being produced and will be available to the public at once.

The unit is finished in ivory baked-on enamel, resembles a streamlined automobile headlight. It delivers ultraviolet rays from one end, infrared from the other. Reflectors on both lamps are built in. Westinghouse Electric Corp., Cleveland, Ohio.



Future home of Thor Automagic Washer construction of which will begin soon

FINISHES

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A wall paint blended with DDT under a new patented process, *Superior 365*, is said to have proved an effective insect control for as long as 16 months after a single coat application.

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For Masonry

A moisture-proofing and decorating compound for masonry such as stucco, brick and concrete, called *Tricoseal*, is a

(*Continued on page 22*)

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IT'S ANOTHER example of the versatility of Brasco Construction and well illustrates the trend to fronts that reveal the store interior for all to see. The clear, uninterrupted view within creates a feeling of intimacy and the shopper immediately responds to the smart, friendly atmosphere.

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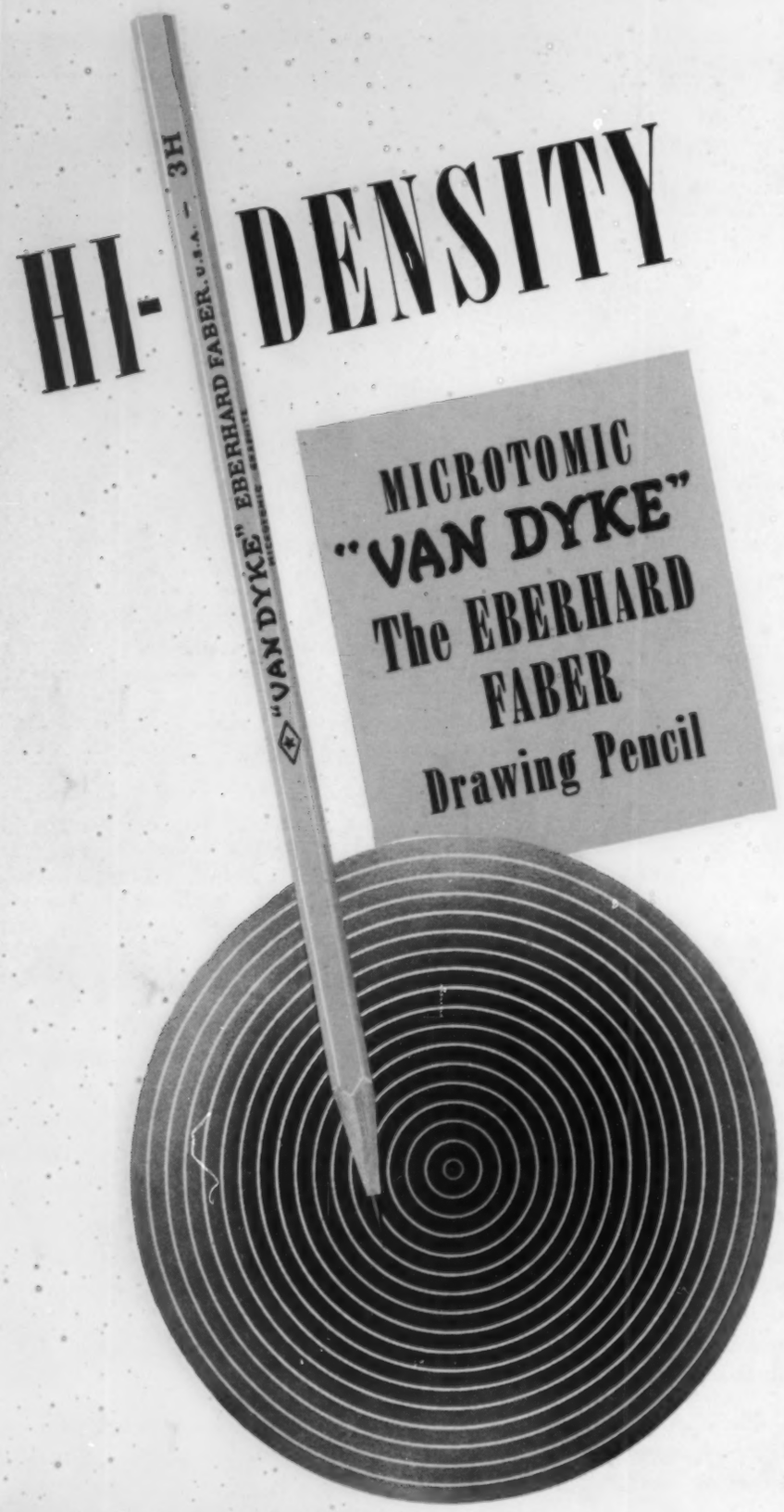

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naturally result from more opaque pencil tracings... and more opaque pencil tracings result from using a lead that gives off a denser line—one that is solidly black. The special HI-DENSITY Lead made by our exclusive MICROTOMIC process leaves nothing to be desired ... For your personal satisfaction, try one and discover the drawing pencil with the quality touch.

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FOR BETTER BUILDING

(*Continued from page 20*)

slow hardening compound in powder form. When mixed with water it can be applied like paint with brush or spray, on inside or outside surfaces, above or below ground. Penetrating and sealing the pores of the masonry, it waterproofs and dampproofs it at the same time. Recommended for basement walls, walls of swimming pools, tanks and vats, for fire walls, cornices, exposed surfaces of concrete bridges and buildings, underground passages and tunnels, etc. Can be obtained in cement gray, white, cream, ivory, light green, buff, blue and brick red; other colors available on special order. American Fluresit Co., Inc., 635 Rockdale Ave., Cincinnati, Ohio.

Waterproof Coating

Recently introduced is an improved *Ranetite No. V Transparent Waterproofing* featuring a base of aluminum and calcium stearate. A clear coating, it is guaranteed to waterproof without changing the texture of the surface; it does not show after application on the outside of any mason finished building. Cannot be applied to any surface which has received paint or oil coatings. Comes ready for use, is applied with brush or spray. Ranetite Mfg. Co., Inc., 1917 S. Broadway, St. Louis 4, Mo.

For Concrete Forms

A newly developed formula for *Formfilm* permits the coating of plywood concrete forms with the same thickness of film in one coat as previously obtained in two. Water repellent, it conditions the plywood so that it is highly resistant to warping or swelling, the manufacturers report. No concrete will adhere at any stage of drying. Tests are said to have proved that reuse of the plywood forms as often as four or five times without recoating is possible. A. C. Horn Co., 43–36 Tenth St., Long Island City 1, N. Y.

GAS BURNER

Fundamental research on a new gas burner for domestic appliances, promising to result in quicker heating and greater economy of fuel, has been completed by the American Gas Assn. Testing Laboratories.

Technically known as the *100 per cent primary air burner*, the new burner draws in all the air needed through an adjustable air shutter, and makes possible shorter and brighter flames which can be placed very close to the object being heated.

(*Continued on page 134*)

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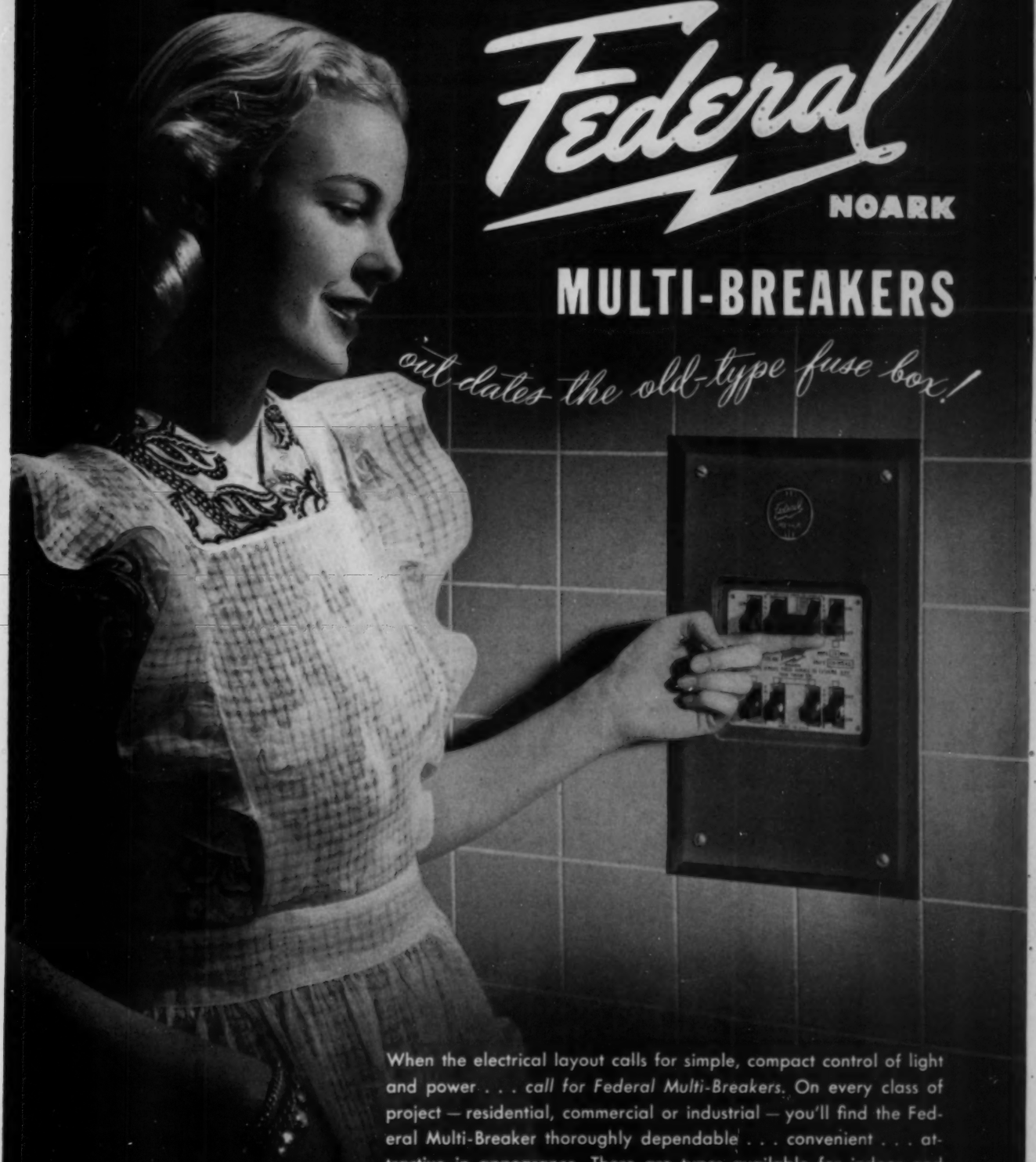

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MANUFACTURERS' LITERATURE

AIR CONDITIONING

Electronic Air Disinfection. A full description and specifications of the "Disinfectaire," an ultraviolet germicidal unit incorporating G.E.'s Germicidal Lamp. Includes information on why air disinfection is necessary, how it works. 10 pp., illus. The Art Metal Co., Cleveland, Ohio.*

ARC WELDING

Airco Arc Welding Accessories (Catalog No. 130). Illustrates and describes a complete line of accessories for all types of arc welding machines and operations. 12 pp., illus. Air Reduction, 60 E. 42nd St., New York 17, N. Y.

BERYLLIUM

The Atom of Beryllium. Brush beryllium copper alloys, Brush beryllium metal and other alloys. Their characteristics and applications. 4 pp., illus. The Brush Beryllium Co., 3714 Chester Ave., Cleveland 14, Ohio.

ELEVATOR GATES

Collapsing Gate for Passenger Elevator Cars, Design No. 9-CG, and **Collapsing Gate for Service Elevator Cars, Design No. 7-CG.** A.I.A. File sheets giving specifications of the two types of collapsing elevator gate. 1 p. ea., illus. Otis Elevator Co., 260 Eleventh Ave., New York, N. Y.*

FLANGES

Pressure-Temperature Ratings for Flanges, Flanged Fittings, Valves. An American War Standard. Tabulates the new ratings, includes chart comparisons of old and new ratings. 20 pp. Tube Turns, Inc., Louisville 1, Ky.

HEATING UNITS

Gar Wood Tempered-Aire Oil-Fired Home Heating Units. Description of and advantages claimed for a complete heating unit, with table of ratings and dimensions. 8 pp., illus. Gar Wood Industries, Inc., Heating Division, 7924 Riopelle St., Detroit 11, Mich.

LIGHTING

Let There Be Light. By Robert M. Stecher, M.D. An article reprinted from the Bulletin of The Medical Library Assn. Discusses light and the general level of illumination, with particular attention to reading light in libraries, reading rooms and private studies. 8 pp., illus. General Electric Co., 8811 Euclid Ave., Cleveland, Ohio.*

Silv-A-King RLM Specification Industrial Fluorescent Lighting Units. Full description, including voltage, wattage, weight and price, of both closed-end and open-end units. Also gives a table indicating the average footcandles obtained at various heights and for various wall conditions with 40 and 100 watt units. 4 pp., illus. Bright Light Reflector Co., Inc., Fairfield and State, Bridgeport 5, Conn.*

METAL TRIMS

B & T Metal Trims: Chromedge. Part of the Chromedge line of nosings, edgings and bindings, cap trims and corner coves, cove base trims, color insert trims, wallboard trims, frames, stair treads, etc. Catalog numbers and specifications. 28 pp., illus. B & T Metals Co., Columbus 16, Ohio.*

MODELS

Study Models of the Future Available Today. A brochure illustrating plastic models made for demonstration and study purposes. 6 pp., illus. Stricker-Brunhuber Co., 19 W. 24th St., New York, N. Y.

OIL FIRING

Peabody CD Wide Range Oil Burning System (Bulletin No. 109). Describes the system, explains how it achieves efficient combustion over a range in capacity as great as 50 to 1, controlling any number of burners throughout all variations in capacity. 4 pp., illus. Peabody Engineering Corp., 580 Fifth Ave., New York 19, N. Y.

PLASTICS

A Statement About DuPont Plastics . . . Present and Future, and **A Review of DuPont Plastics.** Two booklets describing and illustrating the various plastics made by DuPont, with information as to their uses and potential uses. The "Review" also gives a clear and practical properties table of all the DuPont plastics. 3 pp.; 8 pp., illus. E. I. DuPont de Nemours & Co. (Inc.), Plastics Dept., Arlington, N. J.*

REFRIGERATION

Worthington Centrifugal Refrigeration (Bulletin C-1100-B14). Discusses the Worthington Centrifugal Refrigeration System, describes its cycle of operation, refrigerants used, and gives full equipment specifications. 24 pp., illus. Worthington Pump and Machinery Corp., Harrison, N. J.*

SPEED CONTROL

Developments in Reeves Speed Control. A line of special equipment such as variable speed transmission, motor pulley, handwheel, tachometer, etc. Describes each, diagrams operating principles. 30 pp., illus. Reeves Pulley Co., Inc., Columbus, Ind.

TIMBER CONNECTORS

Teco Connectors for Timber Construction in Railroad Service. A discussion of the Teco split ring, spike grids, clamping plates, etc., and their railroad applications. 20 pp., illus. Timber Engineering Co., 1319 Eighteenth St., N. W., Washington 6, D. C.

TERMINAL LAYOUTS

Railroad and Bus Terminal and Station Layout — Vol. I. A handsome album (edition limited) of photographs, floor plans and descriptions of 58 recently constructed or renovated terminals. Gives floor plan of each terminal, architects' names, the lines using it, full structural details of both exterior and interior. 192 pp., illus. American Locker Co., Inc., 211 Congress St., Boston 10, Mass.

VALVE REPAIR

Valve Repair and Replacement Record Sheets. Prepared especially for reconversion checkups. File folder and instructions for using the sheets included. Jenkins Bros., 80 White St., New York 13, N. Y.

VIBRATION CONTROL

Blaw-Knox Functional Spring Hangers and Vibration Eliminators. Conclusions of prefabricated power piping engineers regarding the design of piping layouts for flexibility. Describes the company's spring hangers and vibration eliminators, gives tables of size and load for the various types, installation details, etc. 32 pp., illus. Blaw-Knox Co., Power Piping Division, 1525 Pennsylvania Ave., N.S., Pittsburgh 12, Penna.*

WATERPROOFING

Sika. Integral waterproofing compounds, quick-setting compounds for maintenance, guniting and pressure grouting compounds, dampproofing and jointing compounds, floor hardeners and miscellaneous products. 4 pp., illus. Individual instruction and specifications sheets for each of the various products also obtainable. Sika Chemical Corp., 35–49 Gregory Ave., Passaic, N. J.*

LITERATURE REQUESTED

The following architects and firms request manufacturers' literature:

Louis & Henry, Architects, 1271 Starks Bldg., Louisville 2, Ky.

McClurg & Hesse, 634 N. Central Ave., Glendale 3, Calif.

Samuel Zouri Moskowitz, Architect, 1201 Miners Bank Bldg., Wilkes-Barre, Penna.

T. Trip Russell, A.I.A., 2301 S. Miami Ave., Miami 36, Fla.

* *Other product information in Sweet's File, 1945.*

HOUSES, FASTER AND CHEAPER

"Fifty million dollars for the immediate construction of low-cost dwellings" is easier to appropriate than to implement. Politically it makes a very promising gesture; practically its progress will be slow. The dollars will not be hard to come by. The stumbling blocks are the words "immediate" and "low-cost." Both politicians and returning G.I.'s must face the facts: dwelling construction in quantity can be neither immediate nor low-cost.

Immediate housing will necessarily be makeshift and temporary, using anything and everything that will provide shelter: Quonset huts and trailers, vacant stores and barracks. Stock piles, building materials and equipment must be discovered, released and promptly used.

Scarce critical materials must be produced quickly. But the manpower for this primary production feels the need of the incentive of wage increases. Producers feel the need of higher price ceilings, the incentive of possible profit. Government agencies feel the need of controls to prevent rapid and disastrous inflation. Home seekers, to put it mildly, feel the need of shelter now. The President has passed on to Wilson W. Wyatt, Jr. (housing expediter), the task of adjusting these needs, negotiating compromises, breaking bottlenecks and cutting red tape. His major task is to encourage full production of lumber and millwork, brick, cast iron soil pipe, heating equipment and the other scarce items.

To expedite this crucial program of production involves incentive as well as persuasion, especially if, in Wyatt's own words, "prices have got to be brought within the reach of the veteran." Under present conditions of labor supply and demand there is little likelihood of any reduction in wage rates (and the "annual wage" possibility is still remote). The obvious ways of bringing prices within reach, other than through bonuses, subsidies, public housing or other special privileges, would seem to be:

1. Smaller, simpler dwelling units with bare essentials in equipment — that minimal house again.
2. Improved manufacturing and distributing techniques to cut cost of component parts through greater productivity per man hour. These technological improvements would include increasing factory and mass production methods, dimensional coordination and standardization of parts. But this is a ten-year rather than a ten-month program.
3. Elimination of restrictive practices and readjustment of labor and management policies and programs with a view to greater efficiency. This would include apprentice training, elimination of jurisdictional disputes, code revision, etc.
4. Large-scale construction — the creation of communities, apartment house groups, etc., on comparatively low-cost land.

In the working out of any and all of these methods of reducing prices, the architects and engineers of the country can, if they will, play a most important role in both the immediate emergency housing and in the development of the long-term program of increasing efficiency in the building industry.

Kenneth K. Stowell

EDITOR

JOHN BORROWS PEATY

HEDRICH-BLESSING

The Rugen School, Glenview, Ill.; Perkins, Wheeler and Will, architects. The firm had some 30 schools on its boards at presstime

EYES AND EARS IN SCHOOL

I. AUDIO-VISUAL CLASSROOM PLANNING

by Philip Will, Jr., A.I.A., of Perkins and Will, Architects and Engineers

Philip Will, Jr., studying. The "entourage" is Lawrence B. Perkins, partner, contributing to the power of the team. Frontispiece: Children of Lincoln School, N. Y., record a play

IN this issue, ARCHITECTURAL RECORD is privileged to publish two contributions on the subject of school planning, both of which may fairly be said to stand at the head of an epoch. Both relate to the health and use of the greatest single resource in the possession of the United States — the eyes and ears of its children in elementary schools.

The first article, beginning on the next page, is a technical study with an extremely ambitious aim: to find planning methods which could *make audio-visual education practical in every kind of common classroom now in existence or projected.* This objective took shape in the editors' minds as they watched the phenomenal success of training by visual and audial aids in the armed services — the Navy alone was reported to have used no less than 16 million feet of film for training.

After much consultation with educators and technical men, the assignment was given to architect Philip Will, Jr., with the conviction that, if anyone could find the right answers, he could, with the aid of his partners. At least two years of study have gone directly into this project, and the editors now submit Mr. Will's results to their readers with the utmost confidence. If, in the thousands of schools now building, his advice is heeded, a highly effective new method of education can be incalculably extended, as a service to the future of the Nation. Young eyes and ears will be effectively used.

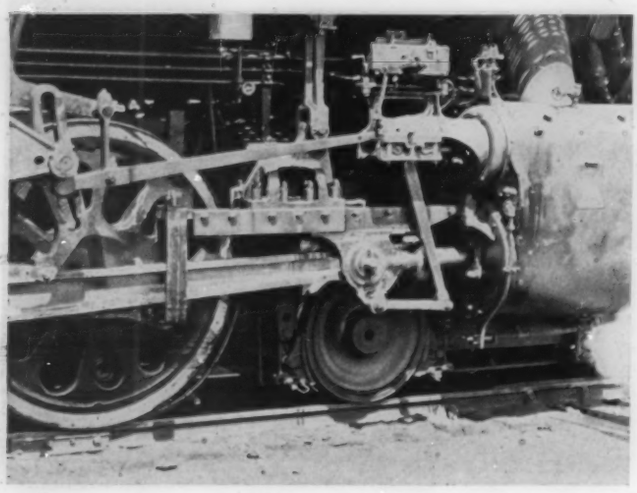
TROUBLES THAT DO NOT EXIST

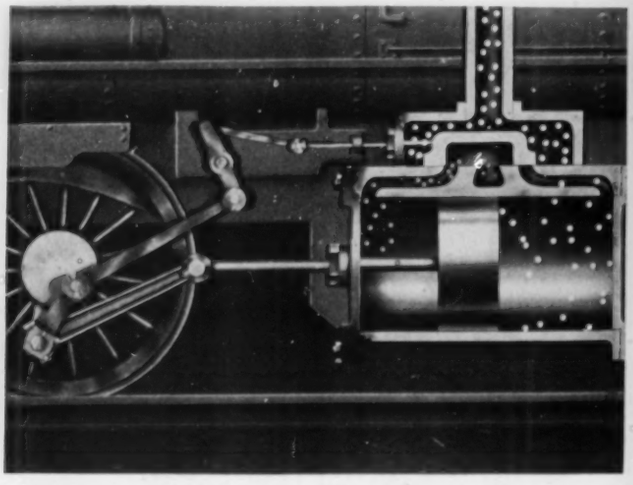
To design classrooms for audio-visual education is simple enough, once the problem has been disencumbered of certain common errors. The major effort made in the present study has been directed toward this disencumbrance, and toward the development of a simple technique of planning for universal application.

Our thesis is that almost any common classroom can be adapted by a competent architect to the easy and frequent use of audial and visual aids. There are further steps to be taken by the school system, but they are beyond the scope of the present study. This first investigation concerns the effective use of the new technique in the ordinary classroom where regular education goes forward day by day and hour by hour. When audio-visual aids can be put to work in the routine, their use will be enormously widened. The trend is toward brevity in such items as films, and toward "spot" use. Therefore, many worries associated in the minds of educators with the idea of long "shows" can be dropped. This should be well understood at the start.

1. *There is no necessity for children to be moved out of their seats to go anywhere else.*
2. *Overheating of the room is not a worry — the machines will not run long enough at a time.*
3. *Ventilation is not a worry — the blackout will not last long enough.*
4. *Special low-level lighting schemes for the period of the blackout are not indispensable, although they may sometimes be highly useful. Light spilled by blackout arrangements will suffice for purposes of discipline and safety.*

Photos, below, show a typical "spot" film subject





WHERE PROJECTION TIES IN

Projection of either sight or sound is merely another step in the extension of visual and audial aids which are already quite familiar. These include the chalk board, the flat display area, three-dimensional displays such as globes or models, the demonstration table for experiments, the speaker's stand.*

Herein we are concerned with the less familiar problem of sight and sound by projection. The architect as well as the educator must note that improvement is to be expected in the *material* which will soon be available, in teaching *methods*, in simplified *equipment;* and that planning must be done in terms of this future, not of the past. Visual aids will be bent increasingly to the flow of education rather than education bent, as now, to the limitations of visual aids.

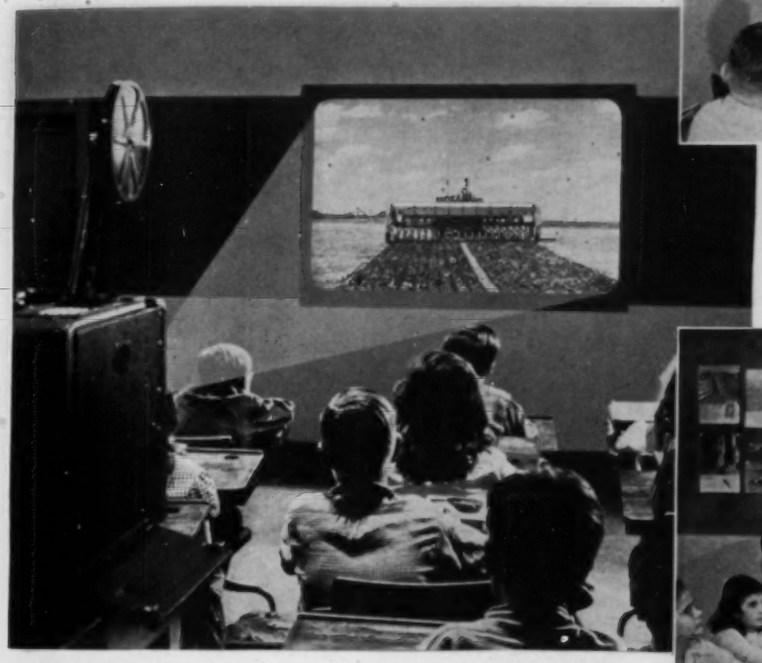
Photographs on the next page show a film being used in conjunction with the more customary visual aids. First, there is advance discussion of the subject (wheat

* *See the full summary in an article by Adrian L. TerLouw,* ARCHITECTURAL RECORD, *Sept., 1945, page 77.*—ED.

farming) with the use of chalk board and maps; then the film is shown; then the film is discussed orally; finally exhibits, both flat and three-dimensional, are collected to augment the visual experience.

The photographs of the locomotive cylinder are indicative of the kind of film now being developed by such agencies as Encyclopedia Britannica Films and commercial firms. They are "shorts" which show, more vividly than charts or chalk, some movement, some detail of intricate construction, or the steps in an operation, which film can demonstrate almost to perfection.

ENCYCLOPEDIA BRITANNICA Photos



1. *Preliminary Discussion, using chalk*
2. *Motion picture as visual aid*
3. *Further discussion, with displays*

ELEMENTS OF PROJECTION PLANNING

Optical considerations determine the projection pattern combined with the seating pattern. The goal is to obtain adequate brightness at the screen, and the appearance of even brightness; to black out stray light that might veil the image; to place the seats not too near and not too far for good seeing and not so far to one side of the projection axis as to distort perspective.

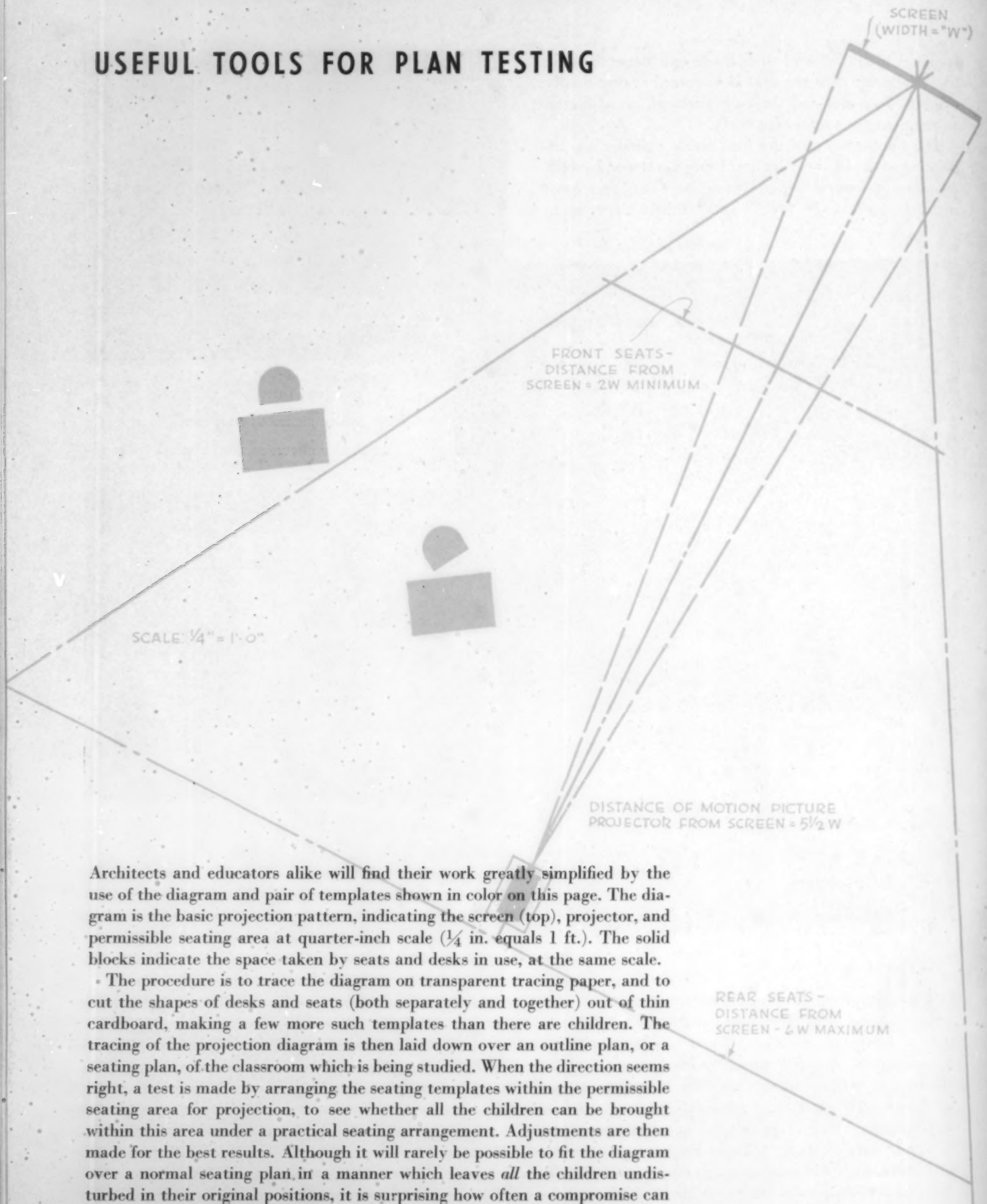
The Society of Motion Picture Engineers has worked out standards for non-auditorium projection, based on the width (W) of the image on the screen. Working forward from the screen on the axis, the nearest seats may be placed at a distance equal to 2W; the motion picture projector will usually stand at 5½W; the back seats should be not farther to the rear than 6W. For classroom purposes the width of the screen may usually be taken as 5 ft., but may be varied for special conditions. (See TerLouw, *op. cit.*)

The two pairs of main planning considerations are given in the table below:

PLANNING ELEMENTS

1. ***The projection pattern, combined with the seating pattern***
2. ***Blackout devices***
3. ***Wiring for projection and for speakers***
4. ***Attention to acoustics***

USEFUL TOOLS FOR PLAN TESTING



Architects and educators alike will find their work greatly simplified by the use of the diagram and pair of templates shown in color on this page. The diagram is the basic projection pattern, indicating the screen (top), projector, and permissible seating area at quarter-inch scale (¼ in. equals 1 ft.). The solid blocks indicate the space taken by seats and desks in use, at the same scale.

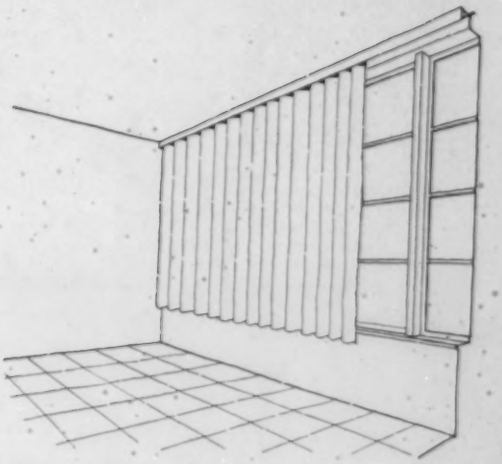
The procedure is to trace the diagram on transparent tracing paper, and to cut the shapes of desks and seats (both separately and together) out of thin cardboard, making a few more such templates than there are children. The tracing of the projection diagram is then laid down over an outline plan, or a seating plan, of the classroom which is being studied. When the direction seems right, a test is made by arranging the seating templates within the permissible seating area for projection, to see whether all the children can be brought within this area under a practical seating arrangement. Adjustments are then made for the best results. Although it will rarely be possible to fit the diagram over a normal seating plan in a manner which leaves *all* the children undisturbed in their original positions, it is surprising how often a compromise can be struck which involves moving *very few* children when projection is about to begin. Examples are shown on succeeding pages.

If another screen size, or another scale, is used, the same proportions should be observed. No major change should be made in screen size without consulting the manufacturer of the projector to be used, to assure correct relationships.

Courtesy, EASTMAN KODAK CO.

Above are seen coupled slide projectors and a motion picture projector by the same manufacturer. Boys can be counted on to run such machines. The trend is toward automatic threading and operation. Another trend is toward reconciling focal lengths, so that all projectors may be used in the same position; until then it will be wise to mark positions permanently in the floor, by an inset of another color.*

For blackout we prefer drapes, awning type shades, or pull-up curtains so that one child can darken the whole room by a simple operation without having anything jam or stick. A large range of tightly woven fabrics is available; flame-proofing will be required. Built-in pockets will diminish dust

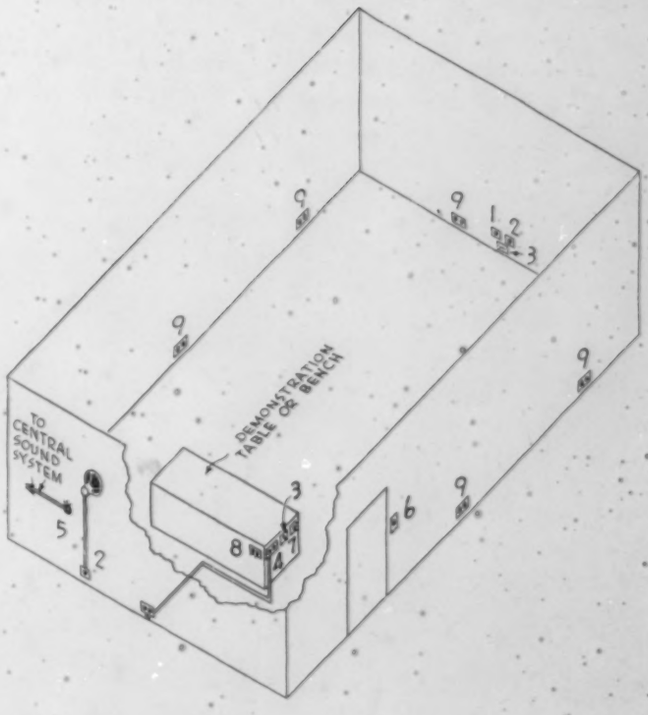


*Dissolve control lets images fade into one another at the screen.

SOUND SYSTEM AND WIRING

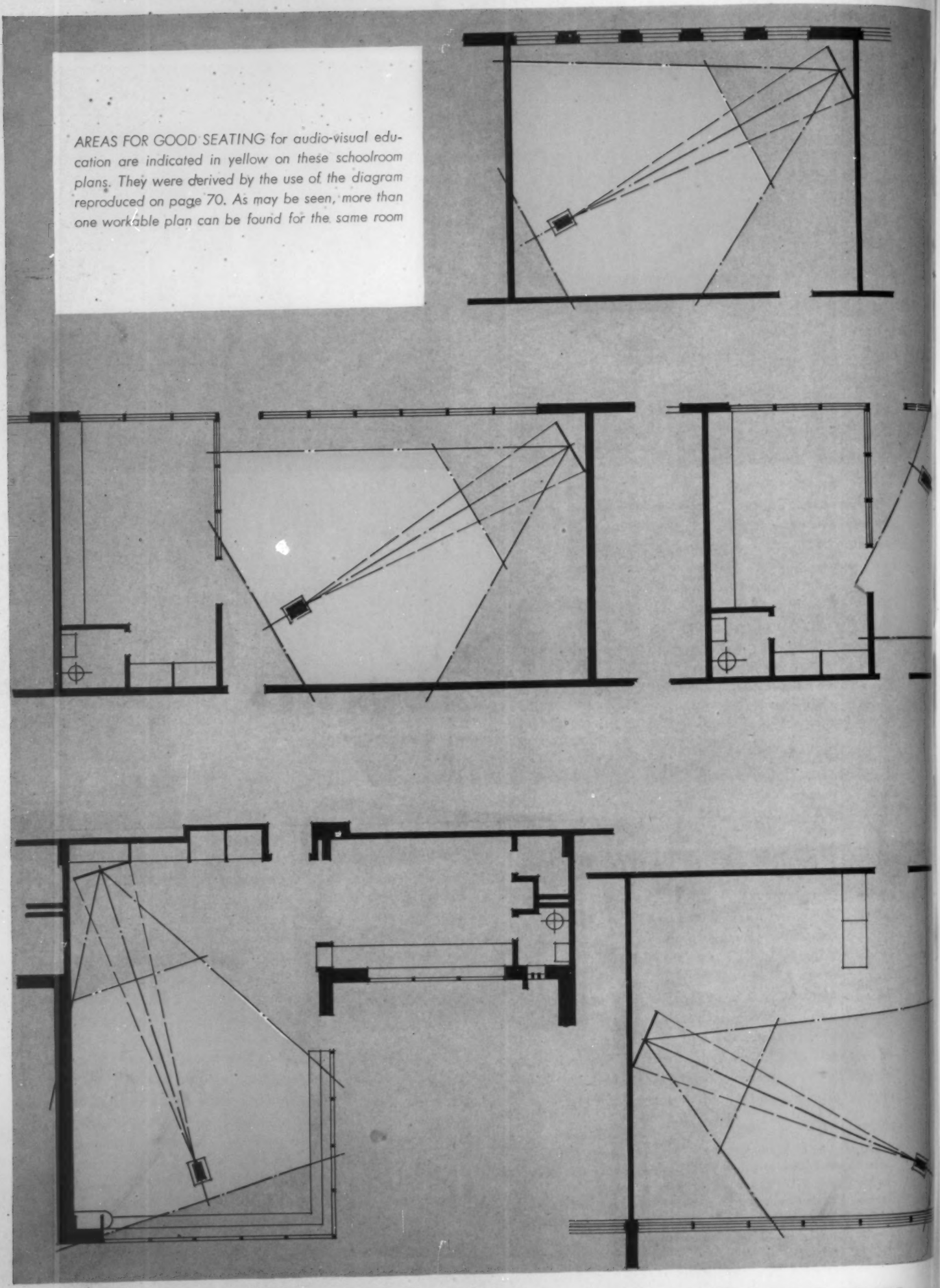
Sound absorption will be provided by drapes and the children's clothes; resonance, by the usual plaster or wooden wall surfaces. Desirable acoustic ceilings are being introduced in classrooms for general use.

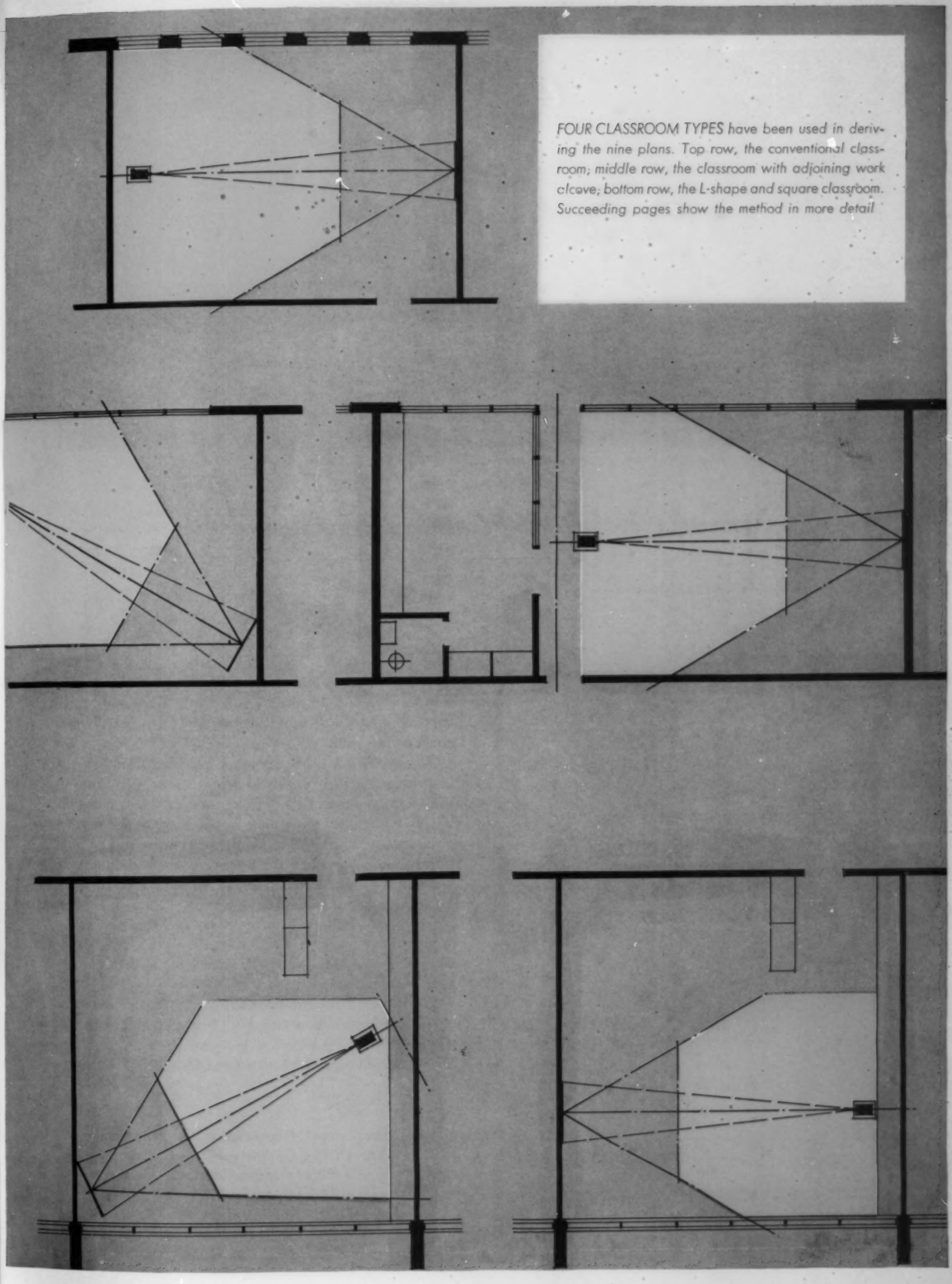
A built-in speaker is a great convenience in any classroom, to be used interchangeably, if desired, with the intercommunication system, the radio-phonograph, or sound pictures. However, there should also be an outlet for portable speakers at the front of the room, connected with the sound outlet for the projector at the rear, to do away with messy "haywire"



A COMPLETE WIRING SYSTEM: (1) Power outlet for projector, 30-amp. capacity fuse heavy wire); (2, 2) Speaker outlets; (3) Control for high-intensity lighting; (4) Wall and bench outlets—two separate lines fused for 30 amperes; (5) Selector switch to radio, intercommunication or classroom speaker; (6) Switch for low-level lighting; (7) Switch controlling ceiling spotlights; (8) Switches controlling circuits in "4"; (9) Convenience outlets, 15 amperes each

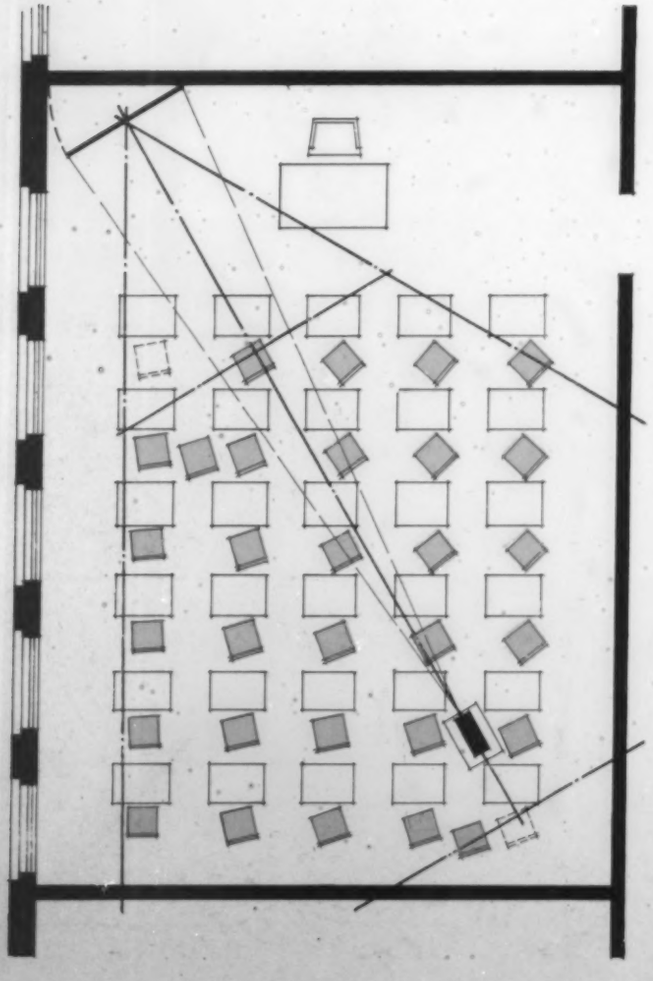
AREAS FOR GOOD SEATING for audio-visual education are indicated in yellow on these schoolroom plans. They were derived by the use of the diagram reproduced on page 70. As may be seen, more than one workable plan can be found for the same room





FOUR CLASSROOM TYPES have been used in deriving the nine plans. Top row, the conventional classroom; middle row, the classroom with adjoining work alcove; bottom row, the L-shape and square classroom. Succeeding pages show the method in more detail

EXAMPLE 1. THE "CONVENTIONAL" CLASSROOM

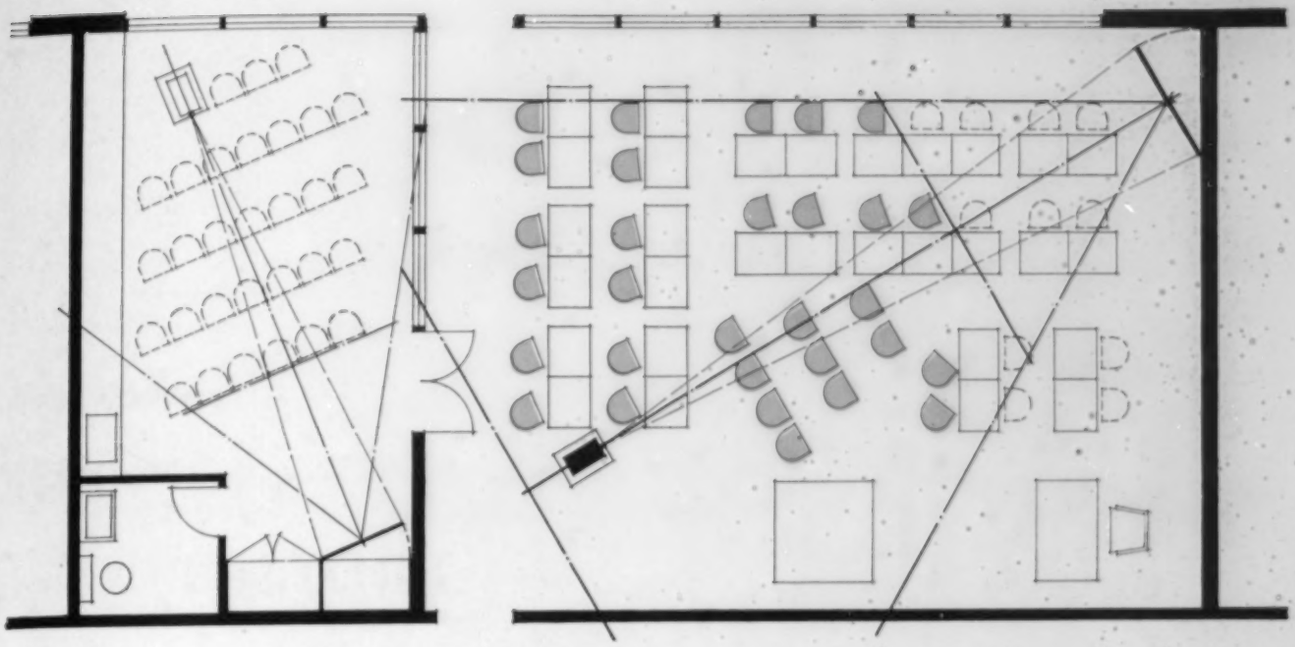


This is the kind of room which is found in schools all through the United States. It is 22 ft. wide and 30 ft. deep. Windows stop at a point about 4 ft. in front of the chalk-board wall.

There might be three possible positions for the projector. Projection might be straight down the center of the room, as seen in the photograph above; or it might be pointed diagonally toward either the inner or the outer front corner. We have chosen the last-named direction because there is a minimum distance to move the stand and projector. Sight lines are unusually favorable — no seat is in the direct line of view of the seat behind it. *Only two children have to be moved before projection begins.* If the room were still shorter, say a minimum of 28 ft., it would still be possible to work this way, moving only two or three seats.

For convenience and easy maintenance, the screen is permanently mounted on a high hinged panel, which is swung out into position when projection is ready to begin. Screen surface must reflect well in wide range.

Yellow squares in the diagram represent seats in position for projection. The child in the front left corner has been moved back to a position behind the permissible front seating line, and the rear corner child has been moved away from behind the projector. In the photograph of a conventional arrangement, the screen has been placed too low, and sight lines are bad

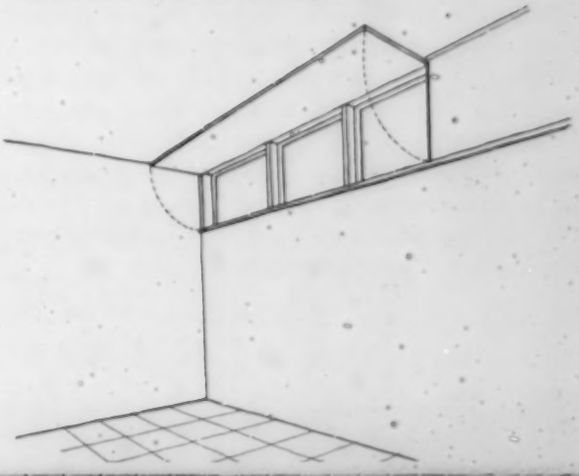


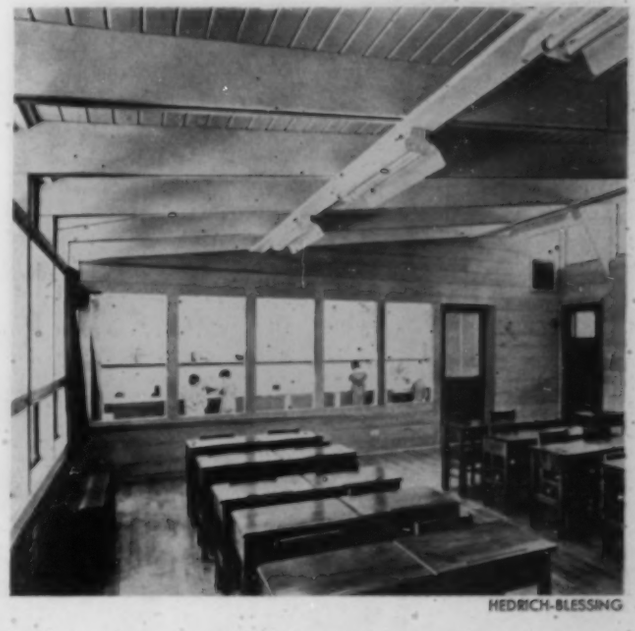
EXAMPLE 2. CLASSROOM WITH WORK ALCOVE

The prototype for this classroom is the typical room of our Rugen School at Glenview, Illinois. In this kind of plan, the general seating is likely to take any one of a number of patterns, especially in view of the bilateral lighting. We choose a likely seating pattern for purposes of illustration, and demonstrate *two* possible solutions in the use of projection.

a. Projection in the main room. Basically, this arrangement is very similar to that in the conventional classroom (opposite page). In this example, 11 seats are moved, before projection begins. Again the projector is on a stout movable stand, can be brought into operating position from the corridor with ease.

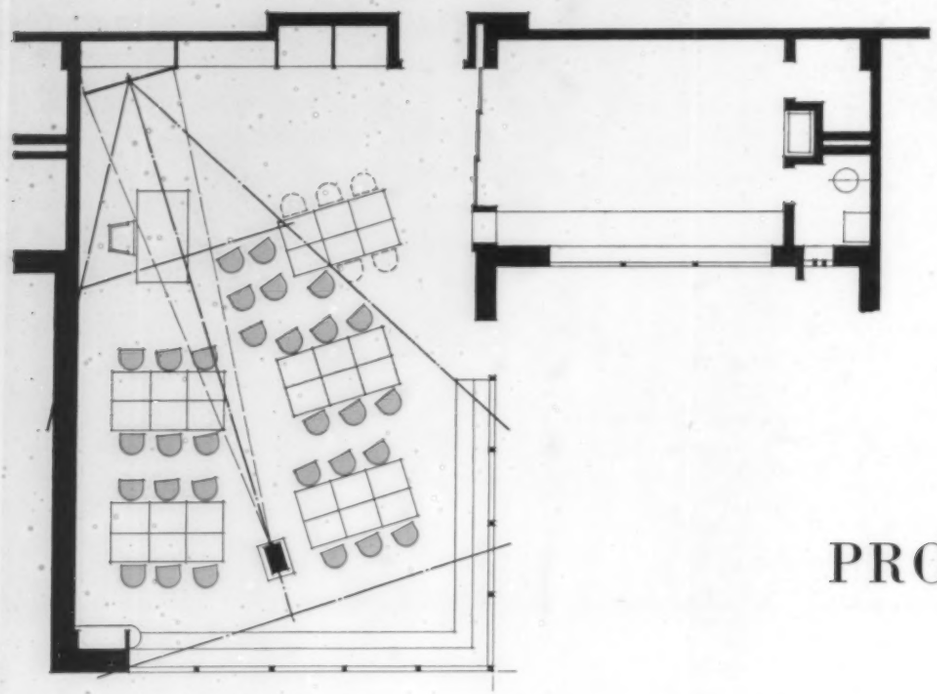
b. Projection in alcove workroom. Children accustomed to progressive education methods can be trusted to carry their chairs with them into the alcove with a minimum of fuss. The projectors of less expensive types, such as silent motion picture or slide projectors, can be very conveniently stored adjacent to use.





HEDRICH-BLESSING

Yellow shapes on the diagram represent seats moved into position for projection in the main room (dotted lines show alcove seating as an alternative). Hinged blinds will be needed to blackout the high transom or clerestory windows, as seen in the drawing. Elsewhere drapes are usually the easiest kind of blackout device for children and teachers to manage quickly



EXAMPLE 3.

THE PROJECTING L

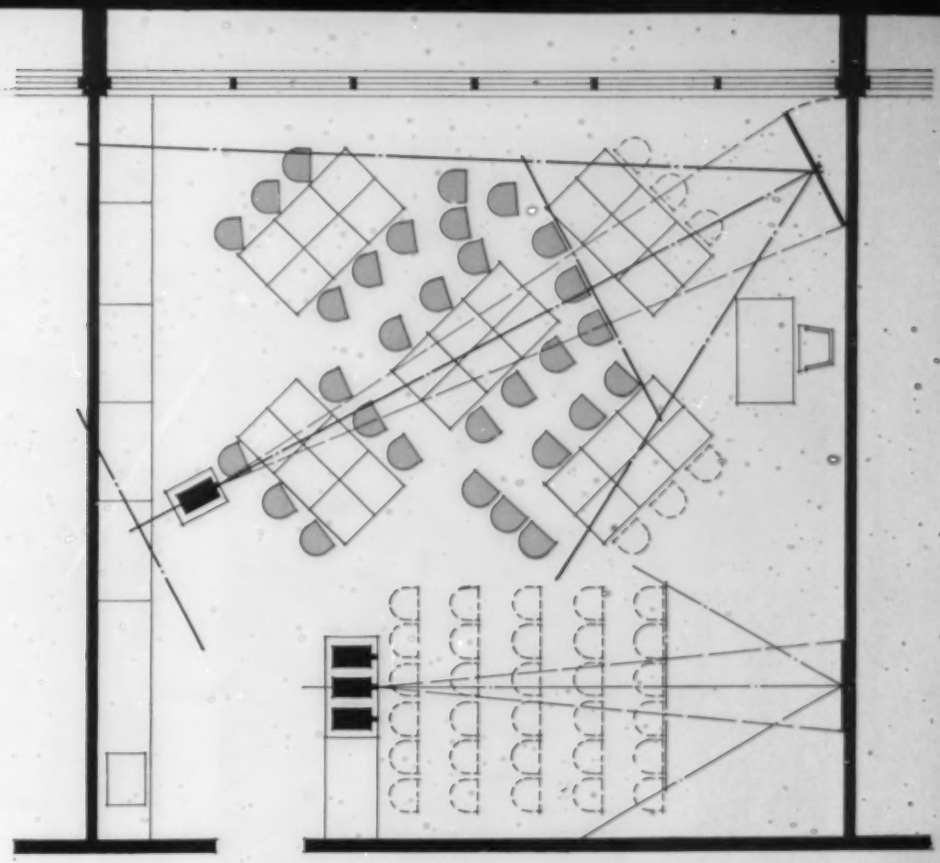
The prototype for this arrangement is the Crow Island School at Winnetka, Illinois, seen in the photograph below. Again, using a hinged screen panel makes it possible to throw the image obliquely. It has seemed better to use the inside corner for the screen, at the greatest possible distance from the windows, even though it might be argued that the corner seen in the photograph would be subject to less veiling light. If we were to use the outer corner, it would also be true that many more children would have to be moved.

This room will need extensive curtaining with blackout drapes, running similarly to the curtain now in use. The alcove has been given a set of sliding doors to cut off the light that might stray in from it.

Only five seats would have to be moved, from the arrangement indicated herein, to put all children within the acceptable projection seating area.

It is interesting that most classroom plans were easier to handle with a movable projector than with any attempt at a fixed or hinged stand.

HEDRICH-BLESSING



EXAMPLE 4.

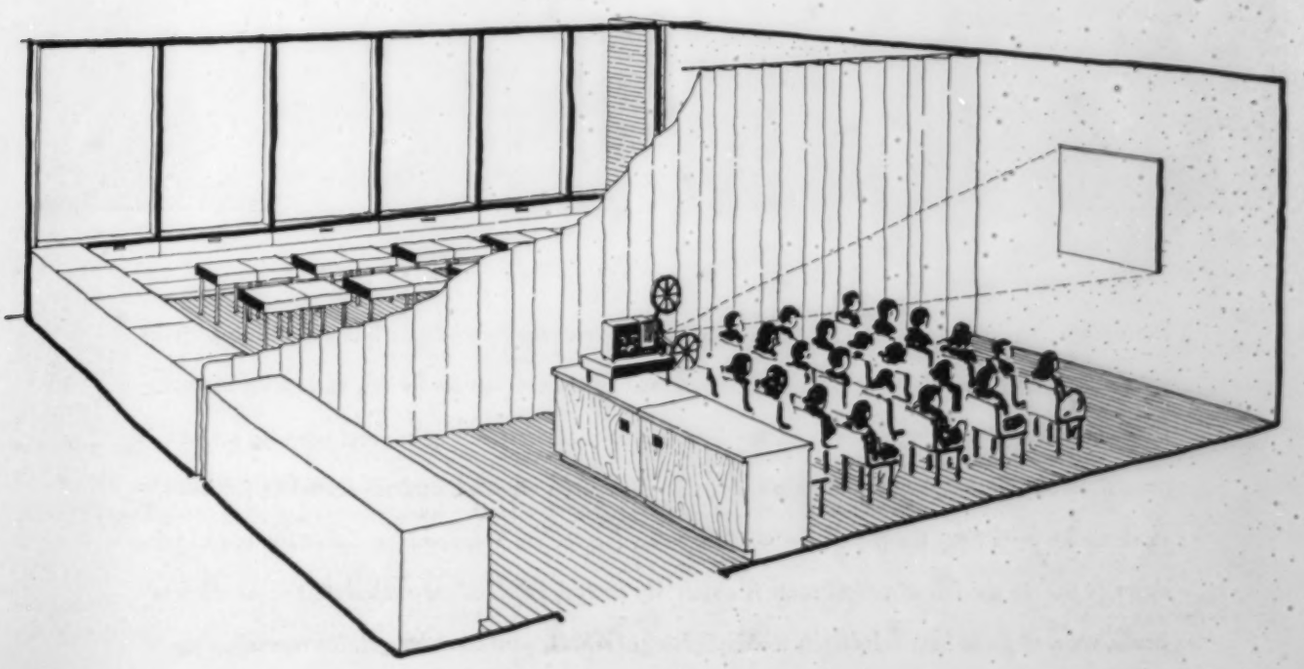
THE SQUARE CLASSROOM

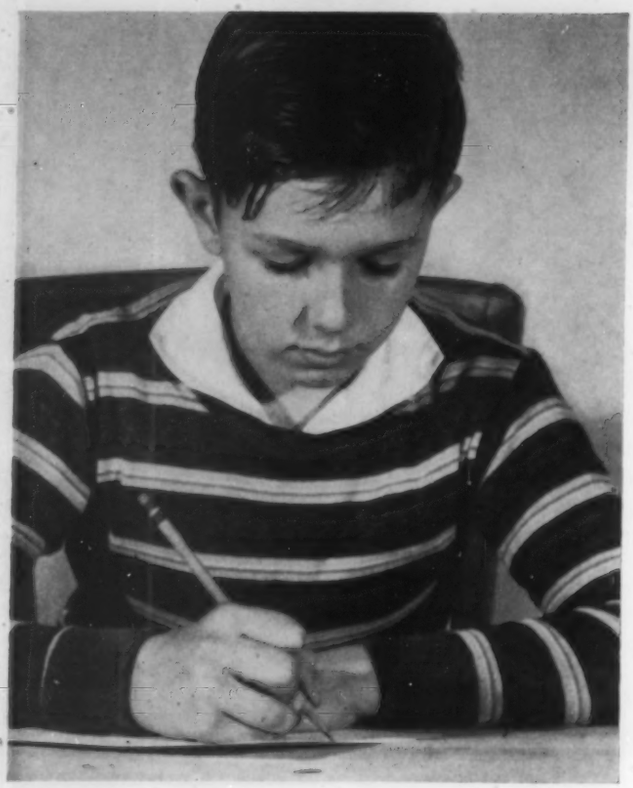
This is a type rapidly spreading eastward from California, where it originated. Code adjustments will soon be made permitting its use in eastern states. It offers a very flexible working area but requires auxiliary sources of light. Again, two solutions:

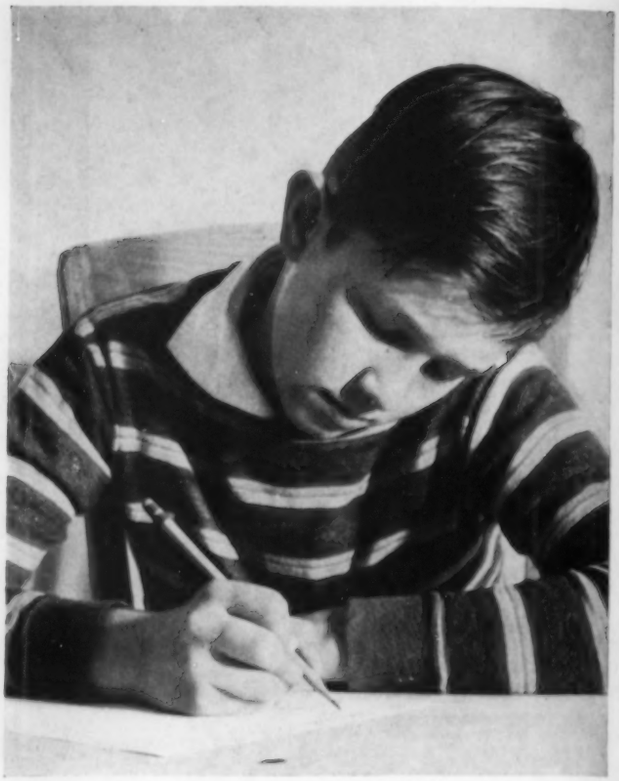
a. Projection in the main seating area. For this use, the entire room is blacked out, with the same drapes that were suggested for conventional rooms. Six seats are moved by a child while the drapes are being pulled.

b. Projection in the "project" area. (Dotted lines.) This solution has much to commend it despite the fact that all children must move. One suggestion is that they sit on the floor, depending on the warmth from radiant heating. The work area, or projection area, is blacked out with a drape of its own, which may also be helpful in deadening noise on other occasions.

This is the only scheme in which a fixed stand is recommended, as seen in the perspective below. Underneath is space for storage of films, slides, records.







The differences in posture seen above are conditioned entirely by changes in lighting. The pictures were taken in the course of screening 160,000 Texas school children for health, and taking measurements on 40,000 of them. At the left, the boy is seated comfortably at a good working surface in good light. At the right, another unposed view, he has shifted his head, by bodily reflexes, just enough to shade his eyes from the glare of a window to his left. When it is considered that the use of windows at 90° to the left of school seats is absolutely sacred, but leads to such distortion of children's backs, we may judge how completely the daylighting of schools must be rethought. *The remedy, page 87*

2. LIGHT ON GROWING CHILDREN

By Dr. Darell B. Harmon
Director, Division of Educational Services, Texas State Department of Health

When the effects of architecture on 160,000 school children are scientifically tested by doctors, that makes news. And when architectural improvements alone are reported to have reduced eye troubles in certain schools nearly two thirds, nutrition difficulties by 44 per cent, infection by 30 per cent, the report cannot be ignored. Doctor Harmon's pioneer work in Texas has been in progress for seven years, and has created a sensation among health authorities and illuminating engineers. But its significance is really architectural. If the doctor has proved himself a splendid architect, he has also demonstrated that the architect on occasion can be the Nation's best practitioner in preventive medicine

1. HOW SEEING INVOLVES THE WHOLE BODY

"CHILDREN do not see to see — they see to act." For this reason seeing involves far more than the mechanism of the eye alone; it involves complex interrelationships that exist between the eyes and the entire body. For the same reason light affects more than the eye. Light is something more than a means for aiding the child in the recognition of words and objects. It is a *force* in his environment, and an important one — a force that can shape or distort the total child, his eyes, his muscles, his well-being, currently or permanently.

These observations have led to more and more emphasis being placed upon the correction of improper lighting, in the course of a school survey that has been in progress in Texas during the past seven years, concerned with the problems of health and growth that affect our 160,000 elementary school children.

It might seem that no factor in the school environment has received more attention from investigators than lighting. From all of this, our children have received not enough benefit in typical schools. In far too many classrooms there persist glaring areas; dark corners; too much light on the children's faces and not enough on their tasks; harsh shadows and bad contrasts; light-consuming surfaces and finishes.

The reason may well be that lighting studies have not been inclusive enough or sufficiently realistic. Too much of our research has been "point" research, not concerned with the child as a totality or with light as an environment by which his whole body is conditioned. Many of the studies have concentrated upon but a single factor in this environment (the light on the immediate working surface), as it affects but one organic system in the child (the eye), in relation to a very limited purpose (recognition of objects and formation of an image); and most of the studies have dealt with a single point in time. Teachers are aware how manifold are the actual adjustments of actual children, and dependent on how much more than the eye, as when one child, faced with bad lighting conditions manages as time passes to conserve both his sight and his energy by devices of evasion, while another child, striving to do what is asked of him, may eventually develop a clinical eye defect and other serious evidences of bodily strain.

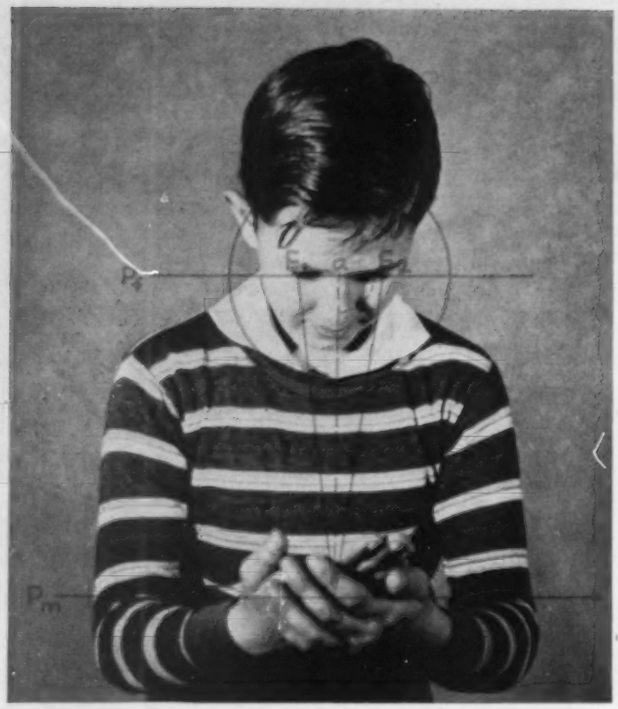
Architects, experienced with the close interplay among form, substance and function, should grasp quickly that there is a whole chain of bodily activities which is set into action by "seeing." Organic life consists of a continuous process of balancing the environment.

"Within limits the human body is an organic mechanism fitted to survive by its capacity to adjust its relationship to the environment in which it finds itself. This is accomplished by shifting the internal balance between various bodily systems and parts, and by modifying or adapting many of its structures to fit the specific environmental factors which it encounters through a period of time. This adjustment of internal balances, and modification or adaptation of certain structures (eyes, muscles, bones, body chemistry, etc.) can be beneficial to the individual, or it can be harmful. The harm done, in turn, can be merely a temporary functional change, or it might be a handicapping chronic affliction."

There are at least five bodily actions consequent upon seeing:

1. The body organizes itself for *readiness to adjust quickly* to what is coming into sight.

2. *Spatial orientation* takes place, the body being aimed or centered on its various tasks so that these may be performed with a minimum of stress.



NATURAL POSITION FOR CLOSE SEEING. The forearms are raised to an angle of about 20° from the horizontal. Plane of face (Pf) is tilted to be approximately parallel to plane of material (Pm). The "line of sight" ab, measured from a point midway between the eye pupils, is normally vertical both to Pf and Pm. Continued distortion of any of these angles causes damage

3. *Adjustment of eye, head, total posture* so that the eyes may function with optical efficiency.

4. Final and efficient *resolution of the visual image*, with clear identification of details.

5. Incitation of *visually determined responses* — in other words taking action in terms of the individual's purposes, needs, and interests.

The need for adequate *intensity* of light on the task has been fully discussed in illuminating literature and the significance of glare is also almost self-evident.

The organic reasons for *lighter colored backgrounds* and for *low brightness contrasts* in these general areas have been less well understood. As the quantity of light striking the total retina goes down, the readiness of the body to perform decreases. This sets up conflicts with the demands for performance set up by the visual task. Still further, excessive contrasts interfere with efficient resolution and make it difficult to maintain attention. For the most effortless vision, the brightness of the total background must be kept just below the brightness of the task.

The need for low brightness ratios is premised upon the bodily balancing we have spoken of. By reflex action, the entire body seeks to center itself on the brightest area affecting the eyes. It seeks a body-centering that will distribute the brightnesses and shadows uniformly or symmetrically over the retinas. If the brightest area by far is a window well off to one side, while the task is a book on the desk, constant effort will be required to overcome the reflex tendencies of the body to center itself in relation to the brighter window. The greater the number of pronounced light and dark areas, the more complex will be the physical conflicts set up in the child in his physical and psychological efforts to establish a balance between environment and work.

Effects on learning and growth

"The child at birth is complete neither in size nor in structure of each of his bodily systems that will eventually work together in making him a coordinated and integrated functioning human machine. The primary task of every child is to GROW — to increase in dimension and proportion and to complete his bodily systems and structures through which he can gain mastery over himself and his surroundings."

Those who have studied intensively how children grow are very aware that the full development of the child's organism and potentialities can come only through function. Because virtually all the educational tasks of children are either introduced or carried on through critical seeing, involving the bodily balancing mentioned above, lighting directly affects growth, both as to *rate* and as to *pattern*.

The child has just so much energy to expend, depending on his nutrition. Therefore only a limited amount of energy is really free for activity. But "activity takes precedence over growth in the use of nutrients." Therefore continued stresses induced by poor distribution of light, by bad contrasts, glare, and other bad practice, might readily use energy needed for growth, for body function, for protection against infection, for defense.

Again, the pattern of growth is inherently balanced and bisymmetric. "A study of the gradients of growth shows that its geometric centers, at any given time, are always at the centers of greatest bodily activity." In other words, "*the child's body grows along the lines of stresses induced in it by various activities, in order to reduce those stresses.* If the environment sets up lines of body stress that are not normal, that do not fit the alignment of inherent and normal growth, the result is structural warping. As the child continues to grow and function in such surroundings, the final result is asymmetrical or unbalanced body structure, deviating performances, and physical or psychological lesions and disabilities."

In brief, if the light is radically wrong, then any purely formal training in "posture" by the teacher only sets up new stresses and deficiencies, puts new obstacles in the way of young bodies already struggling under difficulties. Our discipline can add insult to injury.

When it is reflected, finally, that "a young child in a large measure reproduces exactly what he sees, and learns exactly what he reproduces" it becomes understandable that recent thinking should have progressed beyond the thought of merely supplying enough light on the child's desk to the thought of giving the child the chance to put his bodily mechanism into easy, unstrained, natural and efficient alignment.

A group of leading orthopedists point out that "an individual is healthy only when the body is used so that there is no strain on any of its parts." They compare the human body to a machine, and point out that a mechanical engineer is seriously concerned with factors affecting alignment. "The less well aligned a machine, the more wear and strain there must be, and the greater the probability of trouble. The misalignment and faulty mechanics of the human machine are likewise a potential source of trouble."

2. STRESS DIAGRAMS OF FAULTY LIGHTING

UNDER direction of Dr. George W. Cox, State Health Officer of Texas, the Texas State Department of Health, in January, 1939, launched a long range program in child development as part of its services for protecting and promoting the health of school and preschool children.

The study involved significant collaboration among several professions. Fourteen state professional societies and organizations, including the Texas State Teachers' Association, the State Medical Association of Texas, the Texas State Dental Society, the Illuminating Engineering Society, and organizations of educational and medical specialties, officially formed the Texas Inter-Professional Commission on Child Development to work with the program. The purpose of this Commission was to furnish a single advisory group, representing all the professions concerned, to guide the Division and its collaborating agencies in planning, operating, and evaluating the activities carried on.

During the first three years an inventory was made of physical and psychological difficulties afflicting Texas school children. Simultaneously, a check was made of classroom factors which might be related to those difficulties. These inventories took the form of screening surveys of the health and educational problems of some 160,000 elementary school children, and of the physical aspects of over 4,000 classrooms in which these children were attending school.

In view of the supreme importance of seeing to education, lighting was singled out for further study. Physiological literature fully describes the nervous pathways and other bodily structures which are involved, but few norms were found which would relate these structures to the geometry of desks and classrooms. It was necessary, therefore, to develop by observation and tests in the field what might be called the *bodily geometry of seeing.*

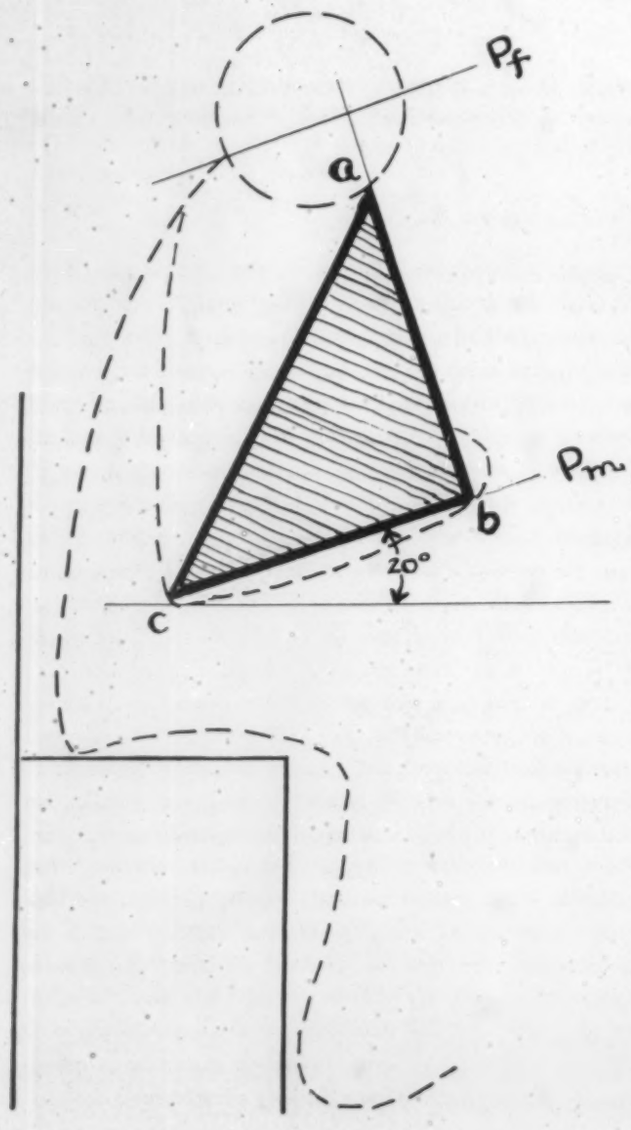
The body supports the eyes

Organically, human beings have more factors alike than different. This is to be expected when we realize that growth, the mechanisms of activity, and the other factors entering into physical existence are governed by orderly, natural laws. For practical purposes, the two eyes are matched optical systems. As such, they must function according to well-defined optical laws. If a visual task requires adjustment of the eyes to function at a certain focal distance for efficient resolution, then it follows that the supporting structures of the eyes (the head and body) must adjust to support the eyes at a distance from the task determined by that focal distance, and hold them there as long as the task is being performed. If the task is one also requiring manual manipulation (i.e., writing, or holding a book), then these supporting structures must not only maintain the eyes at the appropriate distance from the task, but must also support the arms and hands at distances permitting both successful eye-hand coordination and maximum efficiency in continued manual manipulation. These activities must go on simultaneously with the other activities which support the body against gravity, and balance it with all the other demands of the task and in the environment. The common elements in body proportions, optical laws, and body function should reveal basic formulae for such light- and task-stimulated activities, applicable to all children, that could be used in planning classroom surroundings and for evaluating the efficiency of children in them.

Basic body positions for normal vision

The Texas group made measurements of relations of the head, body, and eyes to the working area, and of the action of the various organic systems involved, on several thousand children engaged in close visually-centered activities, such as reading, writing, and drawing. For comparison, similar measurements were made on adults. The report * said: "From these measurements our data demonstrated certain *constant* relationships exist in the forward inclination of the head and trunk in sustained close visually-centered activities, as a result of the body-balancing and orientation reflex mechanisms. When stimulated to such activity, both the trunk and the head lean forward out of the perpendicular to a position where they can be supported in this inclination with a minimum expenditure of energy and by means of minimum activity of the muscles supporting the weight of the head and trunk against the pull of gravity."

* D. B. Harmon, Illumination and Child Development, a paper presented at the Annual meeting Southwest Section, Illuminating Engineering Society, Fort Worth, April 13, 1942.



Sketch by Dr. Harmon to show normal body position for close visual work. Pf, plane of face, approximately parallel to Pm, plane of material. Right-angled triangle abc from eye to palm to elbow. Line bc points to center of gravity of body *(Cf. p. 80)*

By means of these reflex movements the subject reaches a posture for close visual activity where the midpoint between the eyes, the point of each elbow, (the olecranon), and the center joint of each middle finger (the middle metacarpal), roughly describe an equilateral triangle with its base inclined upward from the elbow out of the horizontal by approximately 20°. (See diagram at left of page.)

When the equilateral triangle described by the middle finger, elbow, and midpoint between the eyes is projected onto a forward extension of the medial planes of the head and trunk (the plane described above), as shown in the diagram, the shape of this projection on this medial plane approaches a right triangle. The lower angle of this triangle points towards the center of gravity of the body when seated, and the perpendicular leg becomes the line of sight from the point between the two eyes to the point of fixation. The base of the triangle is tilted upward at approximately the 20° angle that follows the upward slope of the arms.

How to read the diagrams

The photographs with superimposed diagrams shown at the top of page 80 reproduce the front, side and horizontal aspects of a child's reflexly assumed posture when engaged in close visually-centered activity. The line "P_f" in these figures represents the plane of the face, while the line "P_m" represents the plane of the materials on which the child is fixating, such as a book or sheet of paper for writing. Line "P_m" represents the same plane, 20° out of the horizontal, that is established by the forearms when they reach a position parallel to the plane of the face. Point "a" is the midpoint between the two eyes, and point "b" is the point of fixation (the point at which the child is looking).

The line "ab" establishes the upper and forward leg or edge of both the equilateral triangles formed by the midpoint of the eyes, the elbows, and the middle finger joint of each hand. For convenience hereafter, line "ab" will be called the "line of sight."

Points "E_1" and "E_2" in the horizontal drawing of the child represent the points where the plane of the face intersects the foci of the two eyes. Notice that lines "P_f" and "P_m" are parallel in both views, and that the line of sight (line "ab") is perpendicular to both these lines or planes in each of the views. The angles between the line of sight and the plane of the face or the plane of the material approach right angles.

The position of the child's body represented in these drawings is the starting position for close visually-centered activity. This is also the position to which the reflexes attempt to return the head, trunk, and arms, all the time close visually-centered activity is going on, so any other adjustive movements or other postures

assumed during the course of the activity (other than those for relieving normal fatigue) represent stresses or energy expenditures over and above those entering into this basic posture.

According to the Texas data the relations shown in the schematic diagrams are maintained by the body as nearly as circumstances will permit.

In some 40,000 measurements of subjects with normal vision, with few exceptions, the distance which was maintained between the eyes and the work did not vary more than 3 centimeters from equalling the distance between the subject's elbow and the third knuckle of his middle finger, measured on the outside of his arm.

As the eyes moved back and forth over his work, the isosceles triangle (boy at left, page 80) was momentarily altered, but normally these movements, and any posture shifts, did not produce a change of more than 20° in the angle between the line of sight and either the plane of the work or the plane of the face. If this angle is habitually distorted by more than this amount in any direction, there is stress, fatigue.

It should be emphasized that the *child with the bent back* was working not under especially bad circumstances but under circumstances commonly accepted as good standard practice. His desk was at 90° to the window, with light coming from the left. Despite the universal acceptance of this seating arrangement, tests show that sloping work surfaces such as school desks are in the most disadvantageous positions for maximum task light when desks are arranged at right angles to the windows, in rows parallel to the window wall. Working surfaces at right angles to windows create the greatest possible angle between the line of sight and the line of light.

How faulty lighting distorts normal positions

The photographs and drawings on pages 84, 85 show the consequences of unbalanced light not only on the bodily geometry of the child but on his work patterns and on his growth pattern. These pictures were taken from case records in the Texas study. When the photograph was taken the child had been attempting for two years to adjust to sky glare visible through the center portion of the windows. He was also attempting to come to balance with high brightness contrasts in his visual field, the greatest brightnesses being in the upper left of the field.

He is seen working at his desk while he was being given a "square" test. It has been shown by psychologists, who have standardized mental tests, that children at the age of entering school are capable of drawing free hand squares with a limited amount of irregularity. The Texas study has shown that when a line of squares is drawn approximating the size of the subject's handwriting, a child working in correctly balanced postures and light relationships will keep the deviations or irregularities in his squares or in their alignment within a limit of 20° in any dimension. Where tolerances for postures and relationships are exceeded, school children will distort their squares or the alignment, according to the laws of perspective, by an amount mathematically approaching the amount by which they are exceeding their tolerances for eyes-head-trunk-task relationships (this, of course, assumes inherently normal vision).

Without going farther into this fascinating study it becomes obvious that health relationships are directly involved in this bodily geometry adapting to vision.

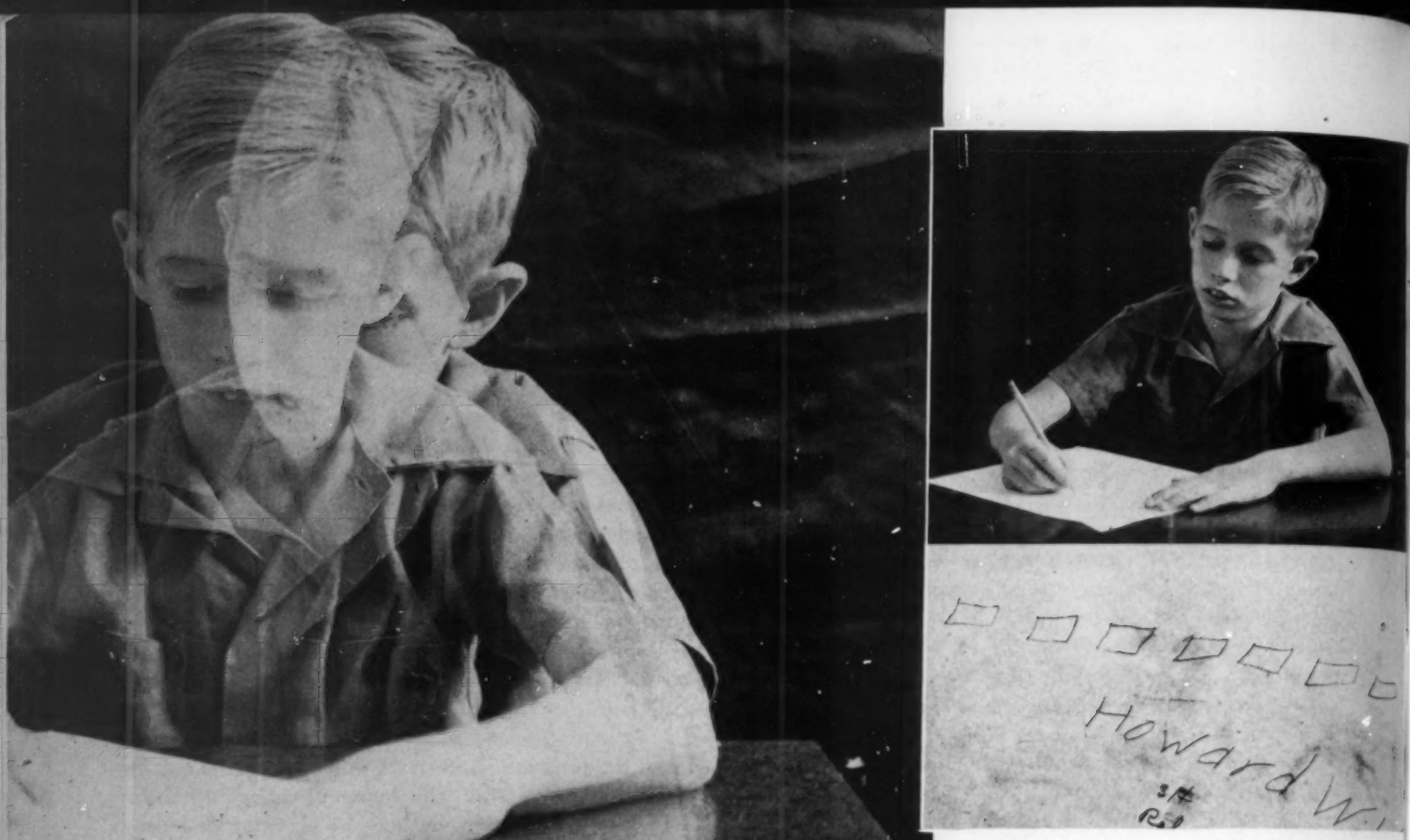
General health improvement through better lighting

The kind of steps which were taken to improve lighting in all the schools in the program will be described in the next section of this article by detailed references to a single example, a school at Mexia. To determine the extent of the effect on the children's health, growth, and performance, health examinations were given in all the demonstration schools at the beginning of the tests and regularly thereafter. The details of these tests have been reported elsewhere and are perhaps not of front rank importance to architects. The procedures met the standards of the professions making up the advisory commission of the program. Architects would, nevertheless, be very much interested in the degree of change obtained by purely architectural methods of planning and construction.

For example, in November, 1942, the 396 children enrolled in one of the grade schools were given thorough pediatrics examinations and nutritional, visual, psychological, educational and other similar tests. These examinations showed that 53.3 per cent of the 396 children had functional and organic visual difficulties; 70 per cent had signs accepted by medical nutritionists as indicative of nutritional difficulties. Six months after the rooms had been redecorated, daylight controls installed, and the seating rearranged, only 22.8 per cent of the children showed refractive eye difficulties, a reduction of 57.1 per cent; in addition, nutrition problems had dropped 44.5 per cent below those recorded at the start of the experiment, and the signs of chronic infection had been reduced 30.9 per cent.

At the same time that the children's health difficulties went down, their performance records went up. Educational growth is measured by school men in terms of months of educational age gained. (A child of nine years and six months, actual age, is six months advanced if he is doing the normal work of ten-year-old children.) In the six months period of working in daylight-controlled classroom environment the children of the experimental school grew a mean average of 10.2 months in educational age, with a median growth of ten months and a modal growth of ten months. In the controlled school the mean educational growth was 6.8 months of educational age, the median six months and the modal growth six months.

With such data before us who would hesitate to say lighting has a very important part to play in promoting the efficiency, the productivity, and the well-being of Tomorrow's People?



THE STORY OF HOWARD. When he first sat down (left) Howard sat straight, but the double exposure shows how much he shifted to shield his eyes from glaring light coming from the left. Howard's task was to make a straight line of equal, free-hand squares

3. HOW DAY-LIGHTING WAS IMPROVED AT MEXIA

TWENTY-FOUR demonstration centers were set up, with the cooperation of the Texas State Department of Education, to test the effects of improvements in classroom lighting.

The Mexia (Me-hay'-a) demonstration center, one of the first to be organized, has attracted unusual attention, because of the unusual effectiveness of improvements secured within the budget allowance of an average small-town school system. In describing the change that was made at Mexia we are illustrating the approach adopted everywhere.

Mexia is a city of 7,000, located in East Central Texas, 85 miles south of Dallas. It is the center of a farming and oil producing area. Mexia has 1,600 children enrolled in its public schools. The W. M. White Elementary School building (photographs, pages 86–90) is 27 years old.

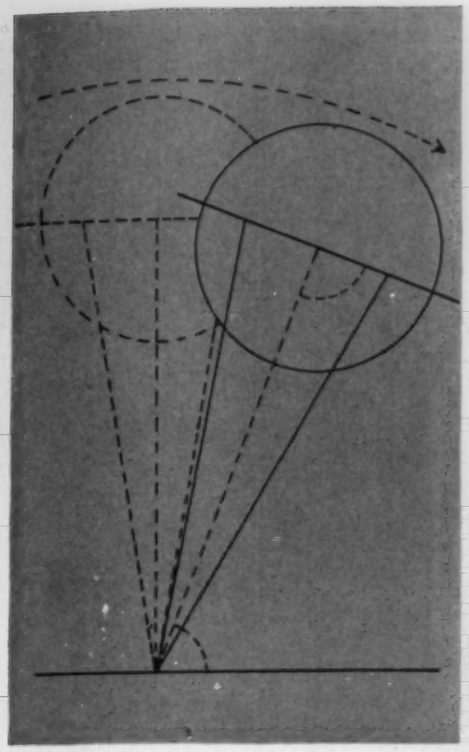
Pictures and diagrams on page 86 give a graphic portrait of the typical classroom in the W. M. White School. It was typical indeed. Floors averaged 21 ft. 6 in. in width and 28 ft. 6 in. in length. The three windows shown in the left-hand wall were 7 ft. by 7 ft., extending to within 6 in. of an 11-ft. ceiling. They were of steel casement type, and were shaded by center-hung roller shades of brown canvas. Glass area averaged 25 per cent of floor area. Exposure was to the south.

Interior reflectivities to light were characteristically low. Ceilings were of metal painted a medium gray whose reflection factor had been brought down by oxidation to 20–30 per cent of the light striking it. Wall reflectivities were down to 40–45 per cent; wood floors darkened by oiling reflected 12 per cent, the trim and woodwork 18 per cent, the desks and furniture, painted brown, 15–20 per cent. Blackboards were mounted on front, inside, and rear walls of all classrooms.

Seating was fixed, at the usual right-angle to the windows. Artificial light was not a factor in the tests.

Footcandle readings were taken in Room 200, and also in Room 308 — with western instead of southern exposure — in February, 1945, by a committee of lighting engineers.* In the chart, page 86, is shown one set of readings at the children's desks. Figures seen within

* *Reported in Illuminating Engineering, October, 1945. "Control of Natural Light in Classrooms," by R. L. Biesele, W. E. Folsom, and V. I. Graham.*



Howard's squares came out just about as crooked as his seating position. His eyes had shifted, according to the arrow, until his line of sight was not normal to his work, which was distorted in a direct relationship

Because bodily growth occurs naturally, at centers of strain, when the strain centers are shifted by continued distortion, growth is also warped. Here, then, is our Howard, front and side

Through no fault of his own, after two years of struggle he has grown a crooked body. It all began when the classroom was supplied, well-intentionally, to be sure, with one-sided lighting

the square of the desk represent light falling on the working plane, at an inclination of 20° from the horizontal. Figures placed diagonally at desk corners represent light falling on the *vertical* plane, at an angle of 45° to the eye. In other words, figures within the squares represent light falling *on the work*, while corner figures represent brightness *on the eye* within the periphery of vision. We reproduce chart only for Room 308.

By comparing the horizontal readings among one another, the engineers established that the maximum illumination on a desk was almost 9 times as strong as the horizontal reading at the inner chalk rail, a ratio of almost 9 to 1.

"A much more significant comparison," they said, "is the ratio of the light falling on the eyes from 45° to the left of the line of sight. In Room 200 each 45° peripheral reading is of the order of 3 or 4 times that of the illumination on the desk top." In brief, there was a violent departure from the rule that "more light should strike the work than strikes the eye."

Description of experimental changes

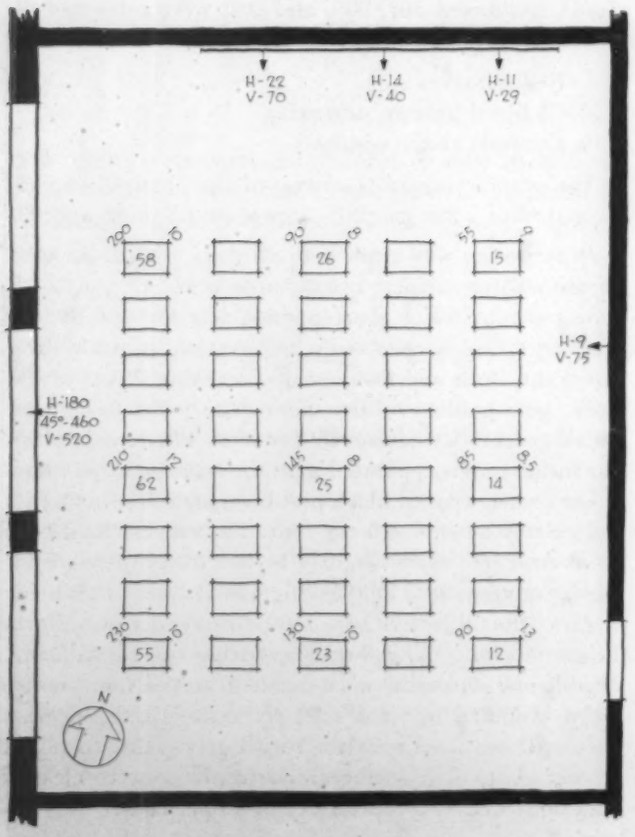
Four rooms were used in the experiment of improving classroom lighting in the W. M. White School. All had identical southern exposure. Room 200, just described, was left unchanged as a "control" room. The other three rooms, numbered 301, 300, and 201, were subjected to measured steps of change, involving

a. Redecoration
b. Changed pattern of seating
c. Controls at the windows

The graphic portraits of two of the changed experimental rooms, 300 and 201, appear on pages 89 and 90.

Redecoration was applied to all three rooms. As seen in the wall elevations, blackboards were covered in all rooms except for a short portion left for use by the teacher. Ceilings, rear walls, window walls, and a drop down the front and inside walls to within 7 feet of the floor were painted with a flat white paint having an initial reflectivity of over 80 per cent. The remainder of the inside wall was painted with the same paint to which a few drops of lamp black had been added, bringing its reflectivity down to 70 per cent. The reflectivity of the front wall was made slightly higher to compensate for the lesser amount of light falling upon it, the result being to give "the subjective appearance of practically uniform brightness on walls and ceilings within the visual field." Woodwork and trim were finished in the same matte paint modified to yield a 50 per cent initial reflection factor; floors were refinished with grey paint to reflect 30 per cent, desk surfaces and furniture were cleaned and lightened to a reflectivity of 30 per cent.

UNCHANGED CLASSROOM, WESTERN ORIENTATION. Similar to Room 200, but with western exposure. Desks at right angles to windows. Colors dim, reflecting a mere fraction of the light. The chart shows footcandle readings. The child at inner rear corner works in one-fifth the light that reaches the best window-row seat. Most distressing are the big figures at left corners of desks. They mean that light falling obliquely on the eye in some positions is 4 times as strong as light on work, creating a major distraction



Changed seating was also carried out in all the experimental rooms, in accordance with the diagram seen on the opposite page.

New lighting controls were installed only in rooms 300 and 201. After the room had been repainted and the blackboard area reduced, the windows in Room 300 were equipped with diffusers and baffles as shown on page 88. When covered with a white fabric the diffusers transmitted 60 per cent of the light, and threw a large part of the remainder upward and across the ceiling from which it was reflected downward again onto the children's tasks and onto surfaces in their visual fields.

In Room 201 structural changes were made as shown in the photographs and drawings on page 90. A panel of functional glass block was built in, above a strip of clear glass windows providing for view and ventilation; this vision strip was shielded from sun and sky glare by a small built-in metal hood.

How much improvement was effected?

After changes had been made, all four classrooms were tested with light meters on the same day, under a uniformly overcast sky. The readings are shown in the accompanying diagrams, in which the initials "FL" refer to "foot lamberts." This is the unit of *brightness*,

indicating how much light is coming *from* that area to the eye. Figures on the floor plans, written without initials, are in *footcandles*, indicating how much light is shining *on* the work.

As might have been expected, the child in the unchanged control room (200) was struggling with every kind of lighting extreme. Intensities on working surfaces varied from 100 footcandles to 5.4 footcandles, a ratio of over 18 to 1. Brightnesses ranged from 1650 foot lamberts at the upper half of the central window to 7.6 foot lamberts at a comparable position on the upper inside wall, a brightness ratio of 217 to 1. The child seated at the front desk in the row next to the window was forced to adjust to a 23 to 1 contrast between the brightness at the left periphery of his vision and the brightness of his task while reading a book. The child in the center of the room was fighting off a similar brightness ratio of 107 to 1; in the rear seat of the inside row the divergence reached the astronomical proportions of 434 to 1.

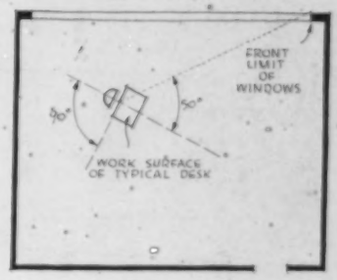
Redecoration, applied to Room 301, solved some problems but left others untouched. By increasing reflectivities within the room, redecoration brought up the *intensity* of the light on the inner rows of desks to at least the minimum which was needed. *Brightness contrasts* among the various room surfaces were brought down to acceptably low levels, but the extreme contrast between light falling on the task and *light falling peripherally on the eye* from sky and sun glare at the window could not be overcome without pulling the shades and thereby diminishing the quantity of light at the inner desks below the minimum needed.

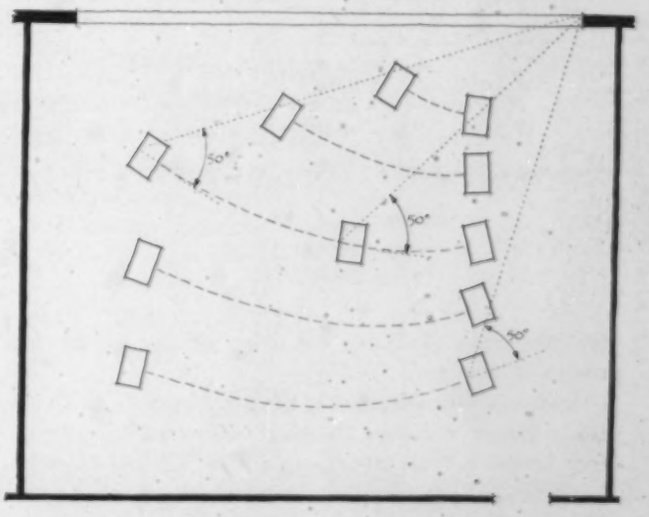
The use of diffusers, added to redecoration in Room 300, not only kept light *intensities* satisfactory, with 16 footcandles at the chalk rail of the inner wall, but the ratio between the highest and lowest intensity was reduced to 125:16, or slightly less than 8:1 (compared to the 18 to 1 ratio in the control room). The extreme *brightness contrast*, between the upper window area and the upper inside wall, was 8 to 1 (compared to 217 to 1 in the control room). The ratio between the brightness in the extreme *peripheral* field of a child seated at work and the brightness of his book was 2 to 1 in the front seat in the window row. (Control room, 23 to 1.) In the center of the room this ratio was 5 to 1, at the rear seat, inside row, 7 to 1. Note that all children had ample light even on an overcast day, and that the range of brightness ratios was from 1:1 to 2:1 except for the left peripheral ratio just mentioned, of 7 to 1 — and even this was well within the 10 to 1 ratio which a number of authorities advance as acceptable.

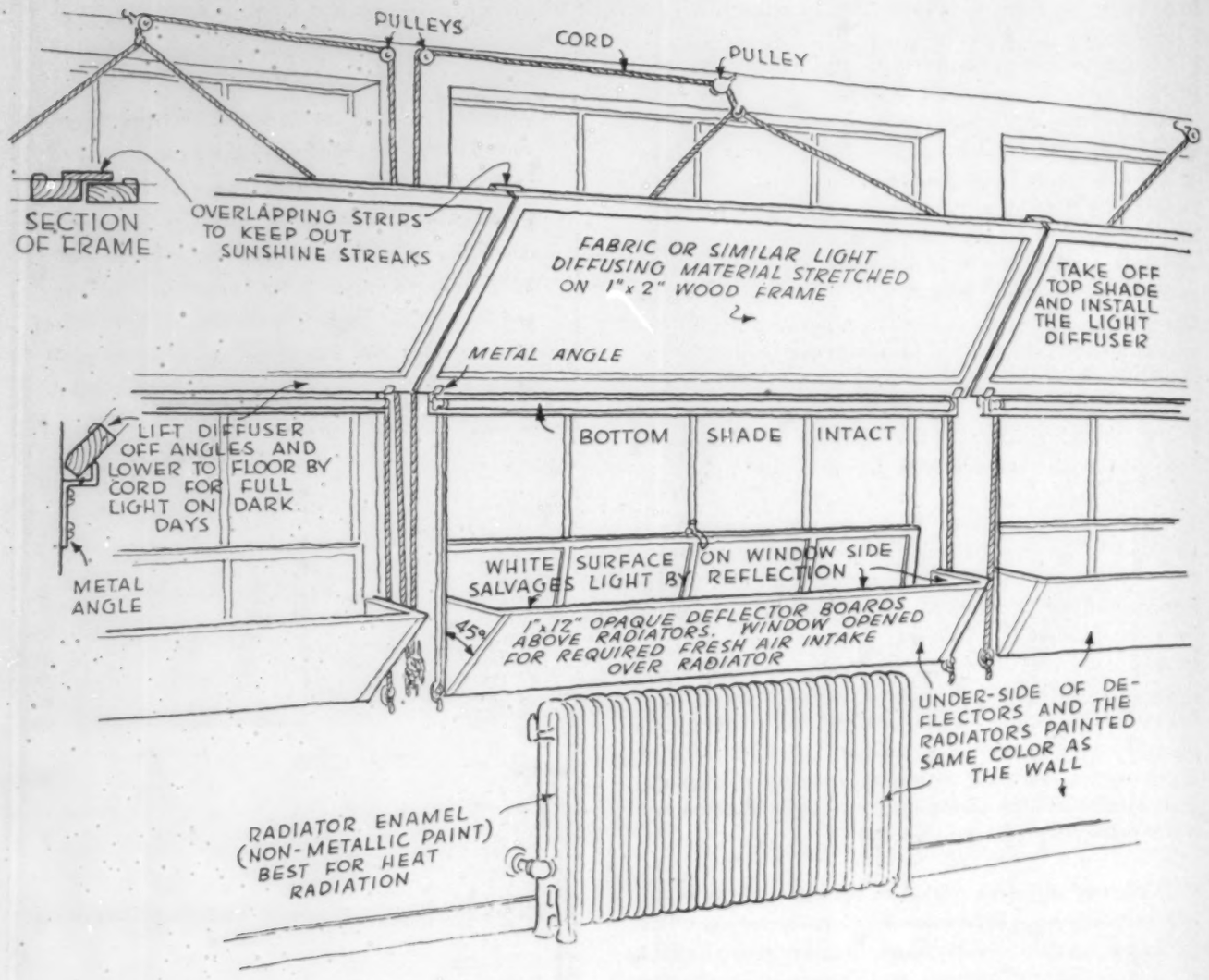
The use of *glass block* for diffusion and control of light direction, in Room 201, achieved the same high *intensities* as the cotton diffusers did, and the same range among them of 125 to 16 or slightly less than 8 to 1.

The *brightness ratio* between the upper part of the glass block panel and the upper part of the inside wall was held down to 4.8 to 1, the lowest reading and there-

ANGLE OF LIGHT — ANGLE OF SIGHT. *Maximum lighting on school desks is NOT reached by the usual 90° orientation. Best light on tasks is approached as the angle between the child's line of sight and the window is reduced. Let the working surface be revolved so that the child faces into the room but with light still coming from the left. Too great a revolution would cause shadows on his work. The ideal position is one in which a line projected from the midpoint of the child's eyes to the front limit of windows will form a 50° angle with his line of sight while he is working. This also gives him adequate protection from sky glare. Rows are curved (photo)*






PULLEYS
CORD
PULLEY
SECTION OF FRAME
OVERLAPPING STRIPS TO KEEP OUT SUNSHINE STREAKS
FABRIC OR SIMILAR LIGHT DIFFUSING MATERIAL STRETCHED ON 1"x 2" WOOD FRAME
TAKE OFF TOP SHADE AND INSTALL THE LIGHT DIFFUSER
METAL ANGLE
LIFT DIFFUSER OFF ANGLES AND LOWER TO FLOOR BY CORD FOR FULL LIGHT ON DARK DAYS
BOTTOM SHADE INTACT
WHITE SURFACE SALVAGES LIGHT BY REFLECTION
ON WINDOW SIDE
METAL ANGLE
45°
1"x12" OPAQUE DEFLECTOR BOARDS ABOVE RADIATORS. WINDOW OPENED FOR REQUIRED FRESH AIR INTAKE OVER RADIATOR
UNDER-SIDE OF DEFLECTORS AND THE RADIATORS PAINTED SAME COLOR AS THE WALL
RADIATOR ENAMEL (NON-METALLIC PAINT) BEST FOR HEAT RADIATION

fore the most desirable condition in any of the four rooms in the test.

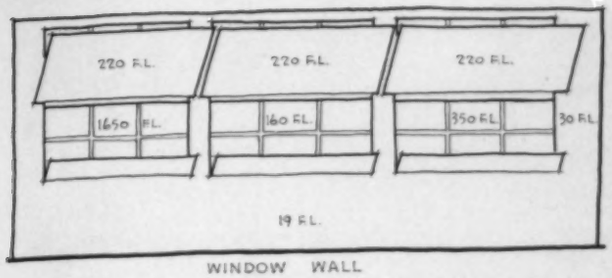
In terms of brightness in the *peripheral field* of view, the children in Room 201 were subjected to only 160 foot lamberts from the glass panel as against 1650 foot lamberts coming from windows in rooms without light control. The child seated in the front seat next to the window had a contrast between the brightness in his extreme peripheral field and his book of only 1.8 to 1. At an angle of 50° to the left of his line of sight the relative brightness was reversed, and the book was brighter than the window in a ratio of 2.9 to 1. Within the entire 50°-cone, the light on the task was stronger than the brightness of light thrown on the eye — not in an extreme degree but at ratios within 3.5 to 1.

Very nearly the same advantageous lighting environment surrounded the child at the center desk. The child seated at the rear of the inside row — the position usually considered the most disadvantageous from the lighting standpoint — was virtually as well favored as the rest of the children. With the exception of a 10 to 1 ratio between the brightness in his extreme peripheral field and his book, the contrasts between the brightnesses in all other positions in his visual field and the brightness of his task in no case exceeded 2 to 1, which again was well within recommended practice.

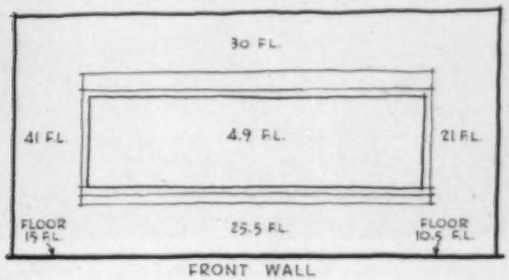
Bursch and Gibson, of the Division of School House Planning, California State Department of Education, in discussing brightness ratios in classrooms said: "a ratio of 50 to 1 would represent an almost Utopian improvement in the great majority of schoolrooms today." To hold these contrasts within a ratio of 10 to 1 demonstrates that today's achievable result exceeds what was Utopia just yesterday.

EDITOR'S NOTE

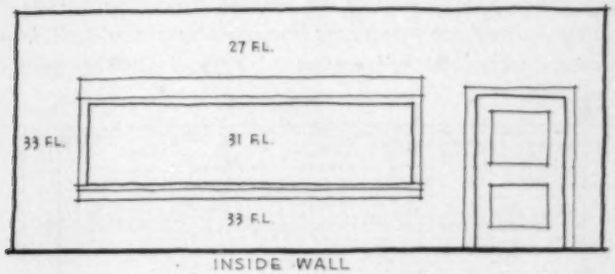
Dr. Harmon's experiments are still continuing, and it is expected that within a few months the Record will be permitted to publish further findings along with the doctor's summarized recommendations to architects.



WINDOW WALL

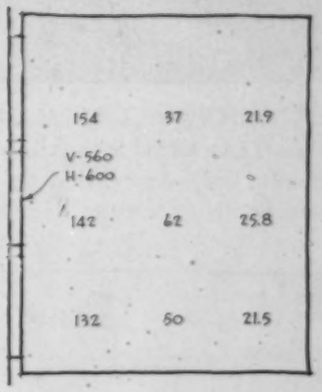


FRONT WALL



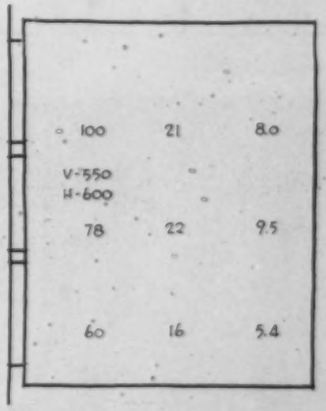
INSIDE WALL

Figures seen on elevations show relative brightnesses in foot lamberts (footcandles of light flux, multiplied by the reflection factor of a surface, equal the foot lamberts of brightness which the eye sees). Floor plans show footcandles of light flux falling on the desks; it is assumed that white paper reflects nearly all of it



ILLUSTRATIONS ABOVE THE LINE REFER TO ROOM 300; BELOW, TO CONTROL ROOM, 200

The control room was left unchanged. On sunny days, shades had to be drawn (exposure was southern), creating violent contrasts for children near windows, and inadequate light at inner rows. Therefore, readings of light at desks fluctuate from 100 to 5.4; while brightness of upper window differs with the upper inner wall as 1650 to 7.6, or 217:1. Light shining from a peripheral angle into children's eyes was 425 times as strong as light on work, at the rear inside seat. In the room seen above, redecoration and the addition of light diffusers at windows has made a startling improvement. Even the innermost desk has 21.5 f.c.; brightness at windows is down from 1650 to 220 f.l.; nowhere is light visible through windows much stronger than the pleasant, full, even light falling on the work. Diffusers, sketched on opposite page, were crude but effective "home-made" affairs



BRIGHTNESSES IN CONTROL ROOM
(in foot lamberts, "f.l.")

Upper windows, 1650 f.l., 1650 f.l., 1100 f.l.

Lower windows, 1650 f.l., 1650 f.l., 150 f.l.

Front wall, upper part, 9.5 f.l. at center; lower, 20 f.l. at center

Front wall left of chalkboard, 18 f.l.; right of chalkboard, 8.3 f.l.

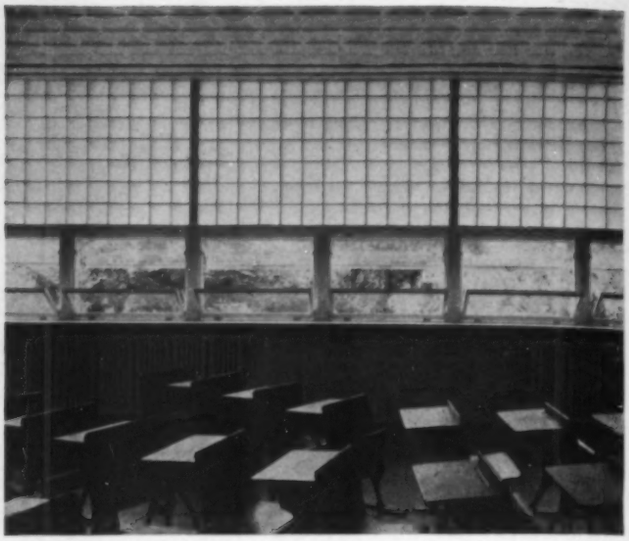
Center of chalkboard on front wall, 1.4 f.l.

Floor at front near window, 8.5 f.l.; near inner wall, 5.4 f.l.

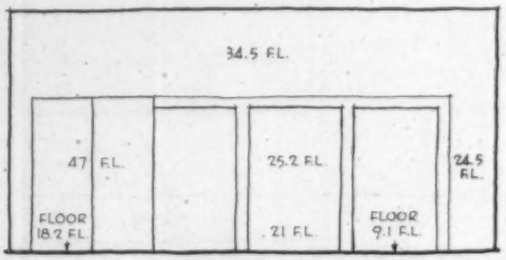
Inside wall, upper part, 7.6 f.l. at center; lower, 19 f.l. at center

Inside wall, left of chalkboard, 8.3 f.l.; on chalkboard, 1.5 f.l.

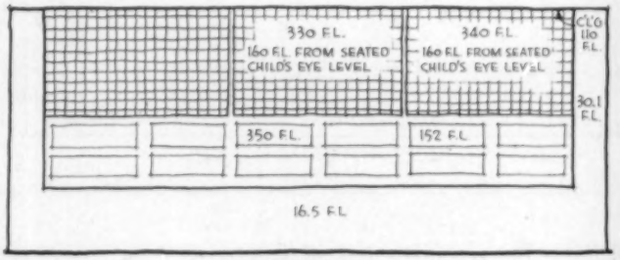
BEST PERFORMANCE, ROOM 201. The use of directional glass block is here added to the previous expedients of rearranging the seats and redecorating for higher reflectivity. A strip of clear window is left for purposes of ventilation and of view out-of-doors



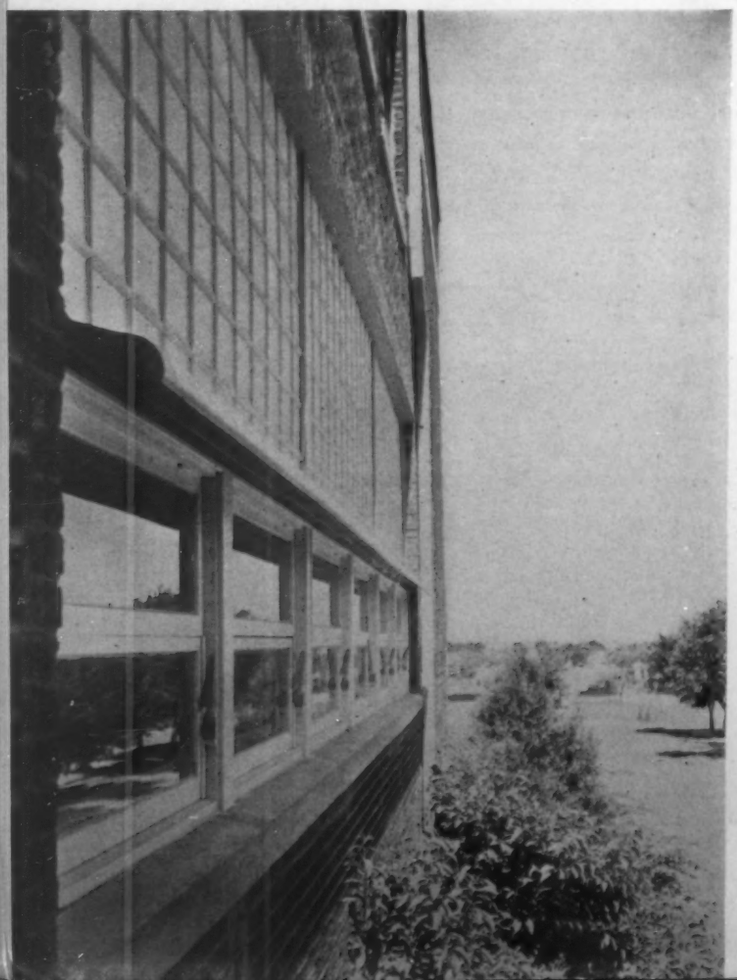
In other respects the room is unchanged, and the cost of the program is well within reach of the average school board. Note that the window strip is protected from glare by a metal hood. In all rooms black chalkboards were mainly covered with white paint

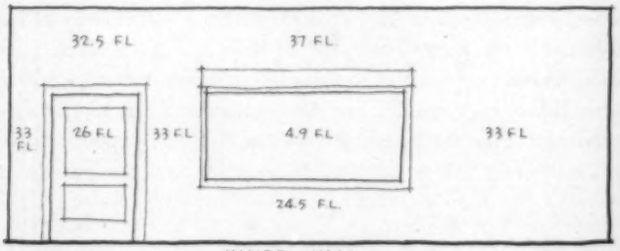


FRONT WALL



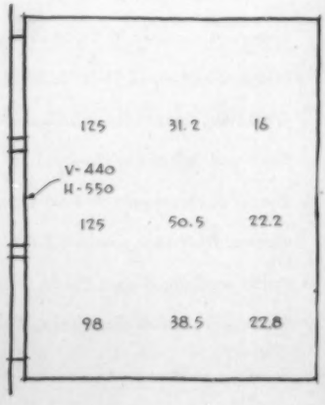
WINDOW WALL





INSIDE WALL

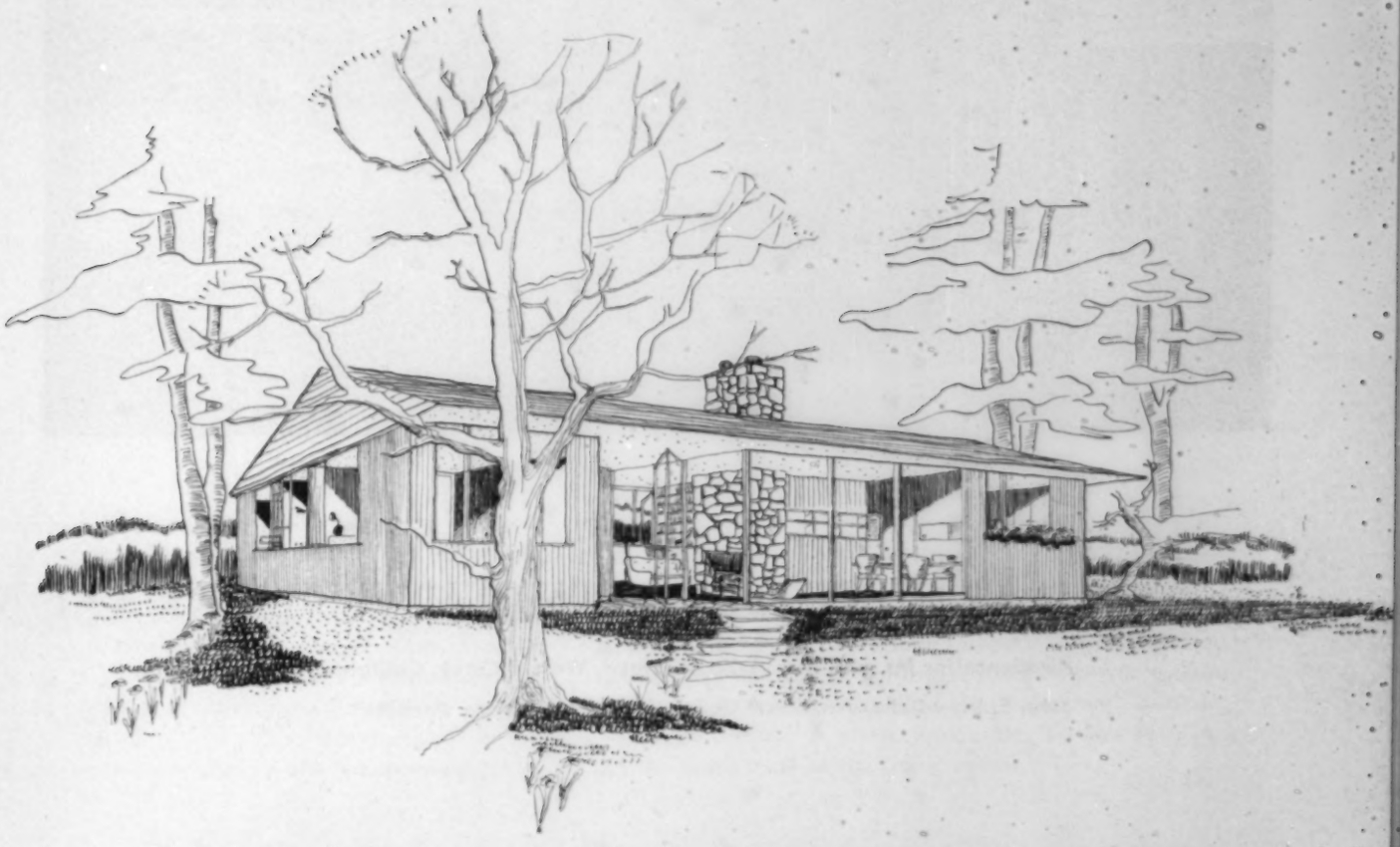
In this room, the extreme brightness contrast was held within a ratio of 10 to 1, whereas hitherto an extreme of 50 to 1 had been considered "Utopian." At the great majority of desks the light falling on the work either exceeded the light falling on the child's eyes or was held within limits easily within the eye's tolerance. In such rooms, children did 10 months' work in 6 months, eye troubles dropped nearly two-thirds, nutrition difficulties were reduced by 44 per cent, infection by 30 per cent, as strain was lessened and energy released for useful work. True saving of "eyes and ears"

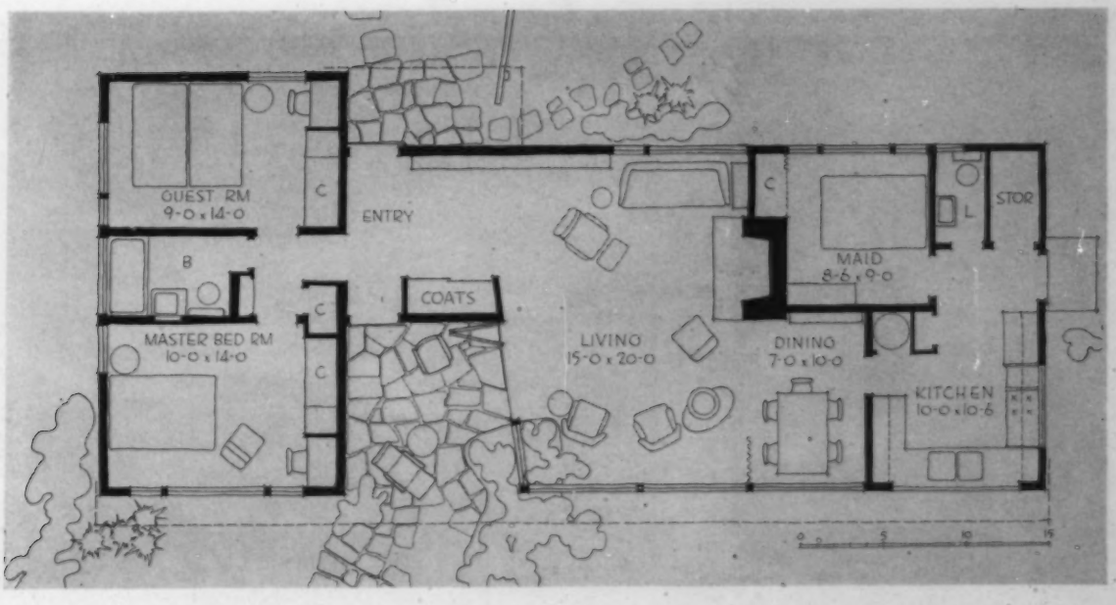


VACATION HOUSE

Hugh Stubbins, Jr., Architect

WHILE this house was designed for a week end and vacation house, to be built on a wooded point near Camden, Me., it is a straightforward design which might serve equally well for a small family for year-round use. It is placed to develop a fine view for about 120 degrees; the recessed porch helps open the view to the living room, also provides a sheltered spot for enjoying it in the open air. The exterior is finished in vertical cedar siding, stained gray, with a wood shingle roof. Inside the walls are plastered; the brick fireplace is painted. Floors are concrete on stone.



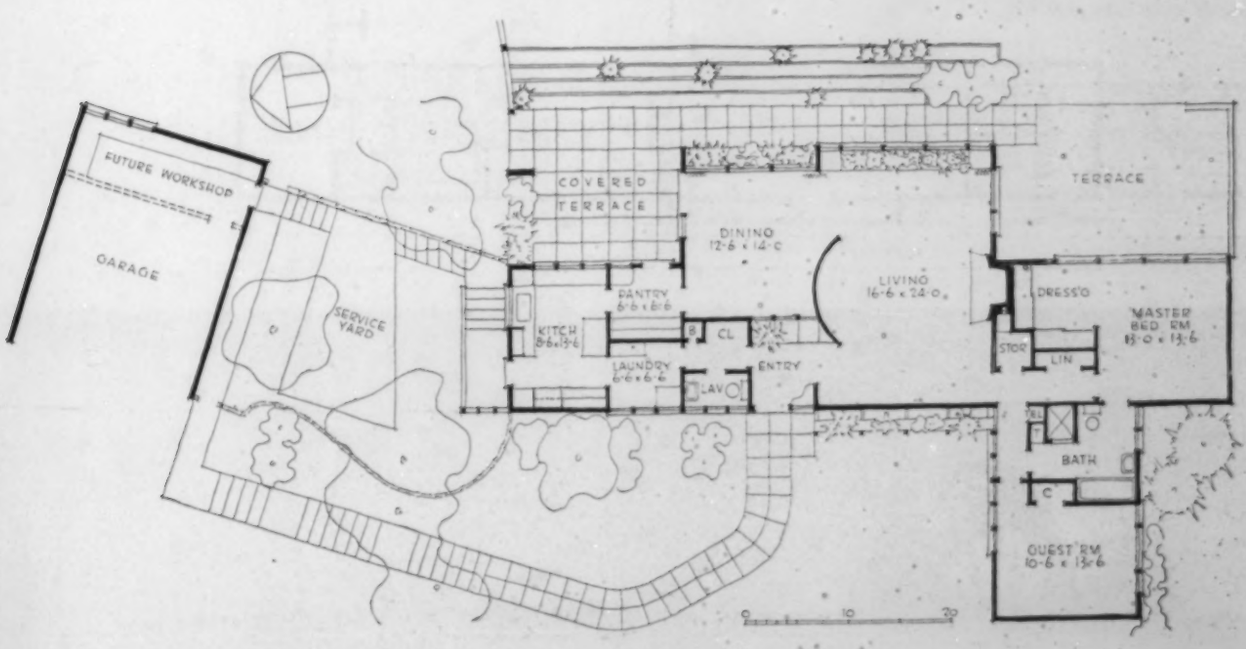


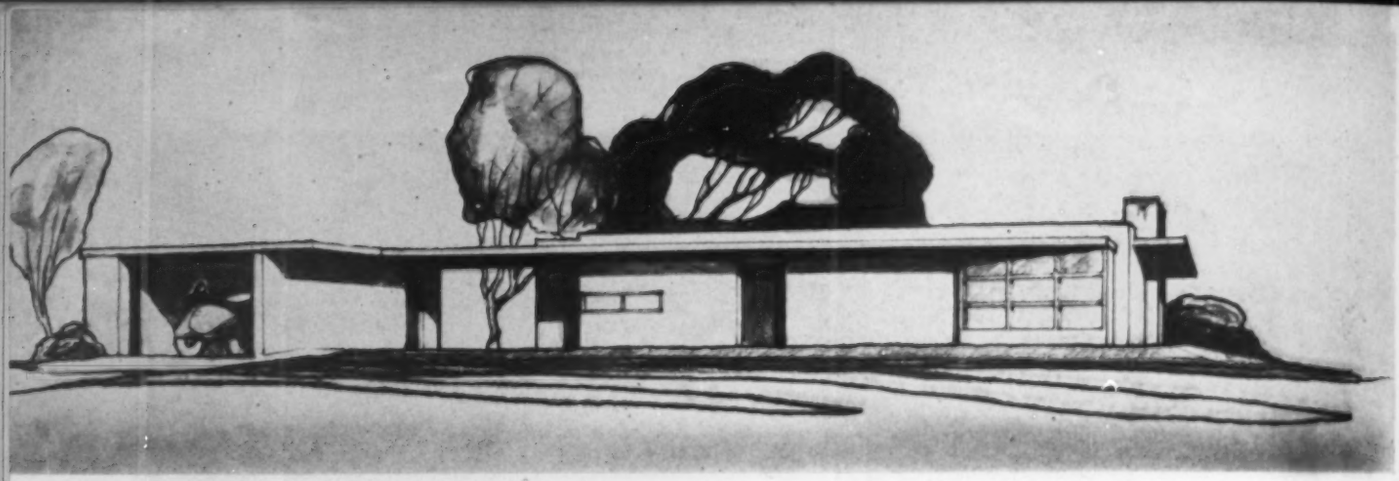
DESIGNED FOR SITE AND SEASONS

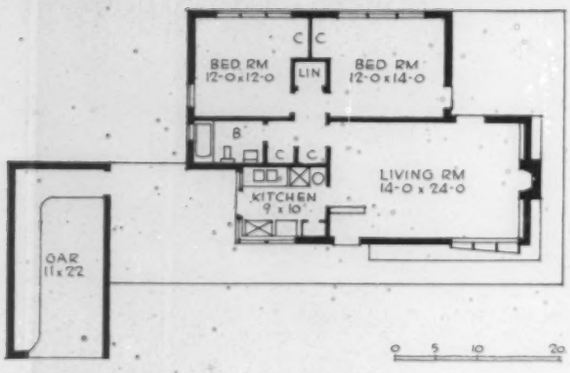
Residence for Mr. and Mrs. John M. Floyd, Walnut Creek, California

John E. Dinwiddie, Architect; Garrett Eckbo, Landscape Architect

THE much-heralded California weather, always a major factor in house design, was more than ordinarily influential in shaping this house. The weather, and, of course, the view. The knoll which is the site for this house faces east with a sweeping view of Mount Diablo. First of all, then, the living quarters and master bedroom must face east, and be open as possible on this side. In the summer the huge oak tree doesn't help the distant view, but it does block out the morning glare, and its shade is welcome through the hot, dry months when the screened north terrace gets the most use. The south terrace, which gets the heavier use in the winter months, was left open. Exterior is vertical cedar siding, stained a dull gold, roof shingles natural cedar. Sash are painted an olive green with tan trim. Concrete walks and terraces are given a light tan color, and have a scratched surface as a safety measure. Terrace floor is at the same level as the living room.





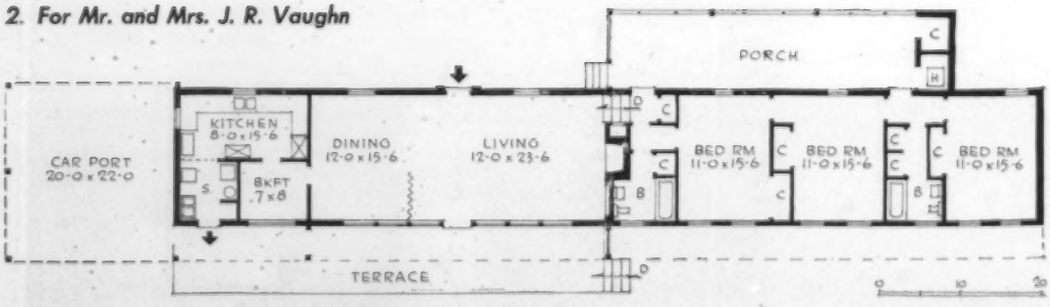


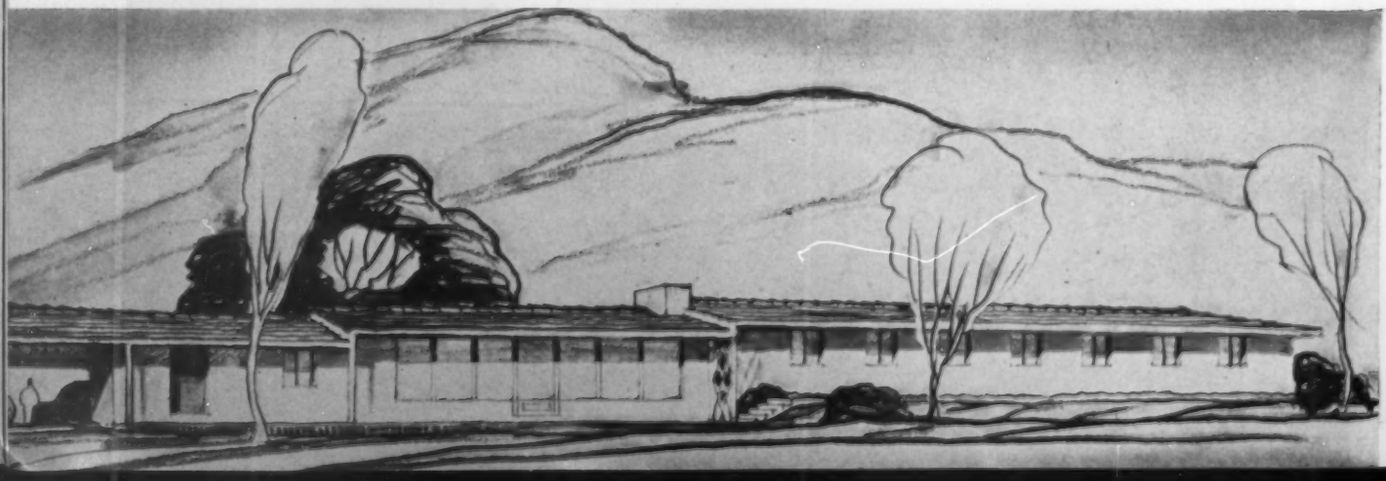
1. For Mr. and Mrs. Robert Hull

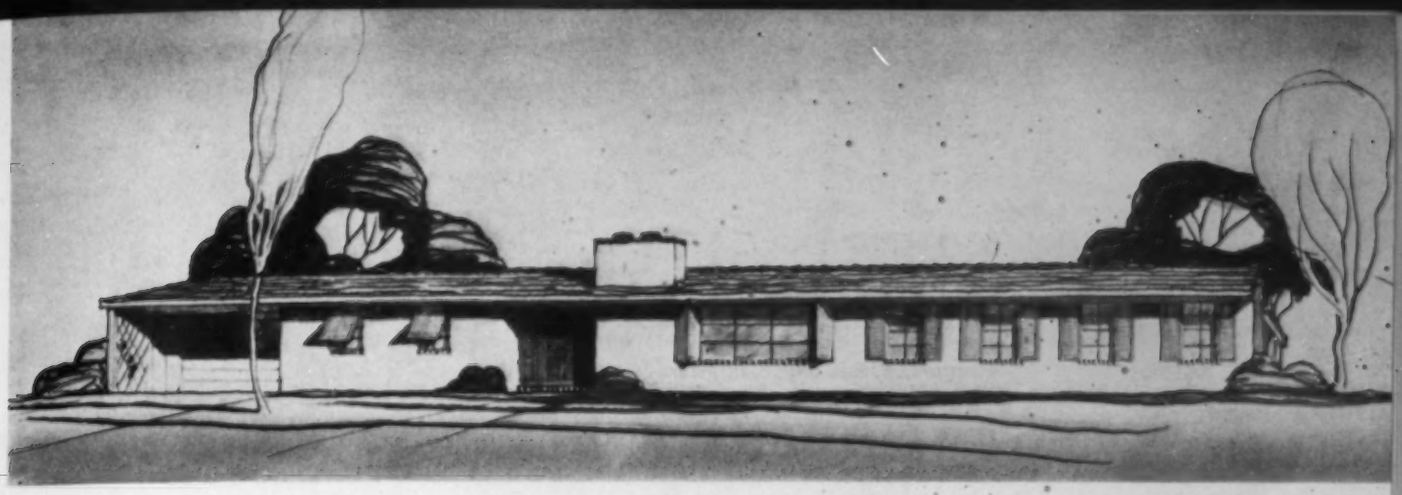
FOUR HOUSES TO START ARIZONA'S NEW BOOM

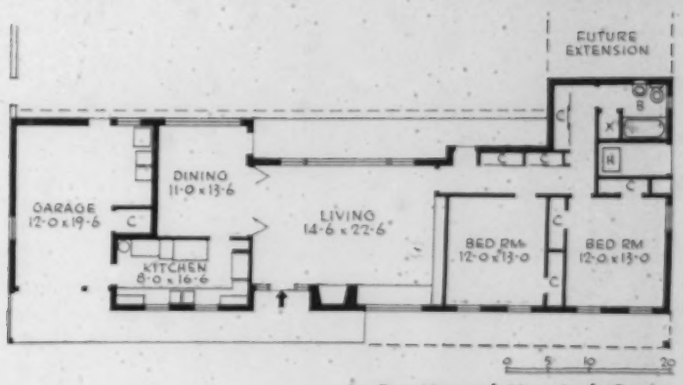
Arthur T. Brown, Architect

2. For Mr. and Mrs. J. R. Vaughn





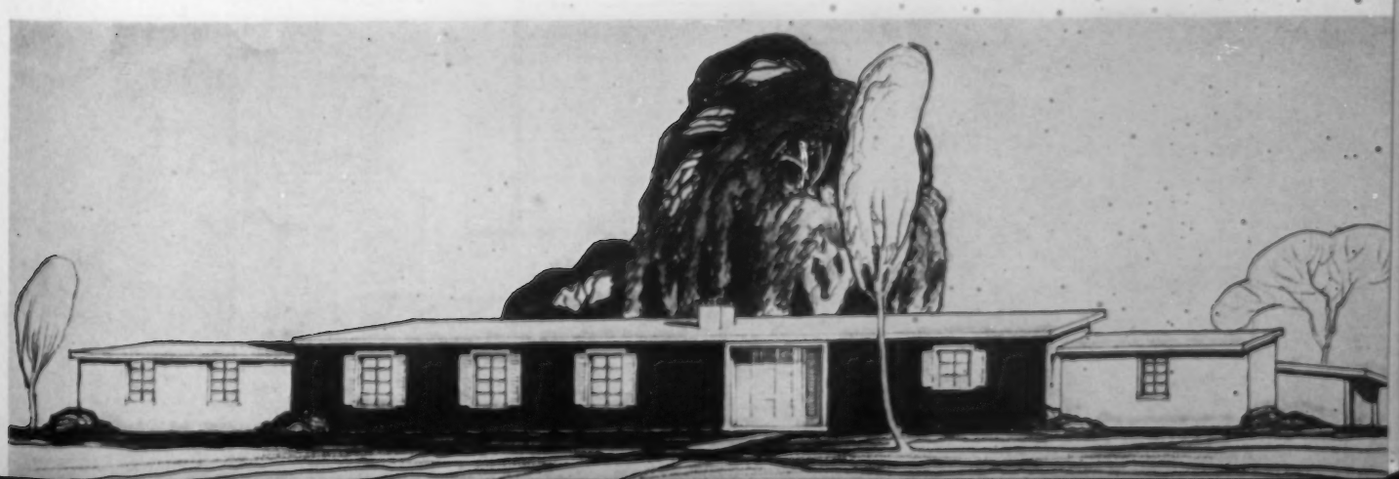




3. For Mr. and Mrs. Jack Carson

IT MAY well be that by the time these designs appear in print all of the houses will be well along toward completion. For, unlike most of the country, Arizona does its heaviest building in the winter months. Consequently architects, clients and builders were waiting for the lifting of the now-forgotten L-41 to start a scramble for materials and labor and get going. The designs are accordingly even more simple than the usually simple ones he does for the Arizona climate, in order to use a minimum of materials and to keep costs down. A special point about the Hull house is a garage plan that will permit the owner, a wounded war veteran, to get from car to wheel chair to house without assistance. The Vaughn house is strung out in a long line to take advantage of excellent views of Catalina foothills in two directions. Natural contours place the bedrooms higher than the living areas. The Carsons asked especially for a dining room that could be closed from or joined with the living room, also for lots of closet space. All designs stress outdoor living.

4. For Mr. and Mrs. Meredith Wood

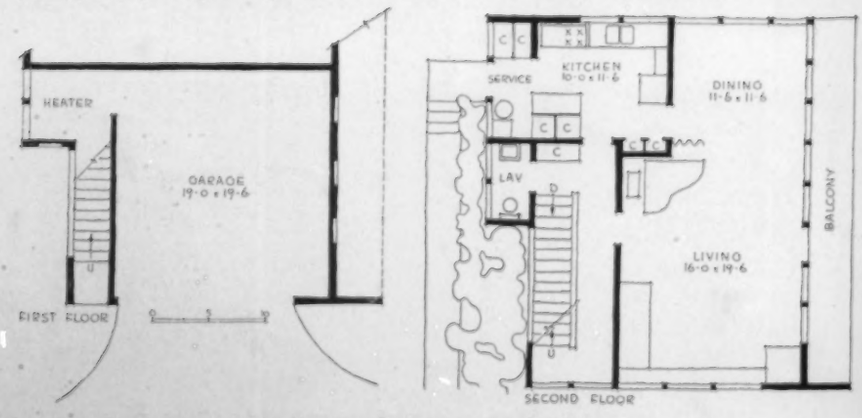


STEEP SITE, SMALL BUDGET

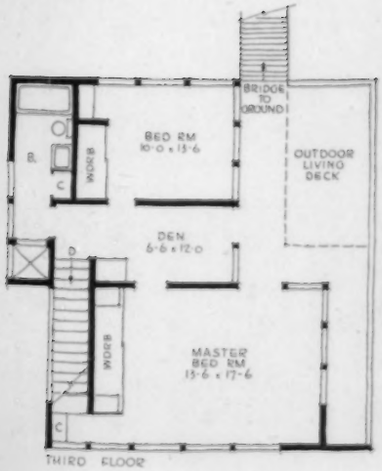
Residence for Mr. and Mrs. A. J. Polito, Los Angeles, California

Raphael S. Soriano, Designer

JULIUS SHULMAN Photos



HERE is a case where "modern" design necessarily takes on something of the cubist aspect, because nothing but a cube form would sit on this extremely difficult plot. Without the freedom in styling here assumed, the problem simply could not have been solved. Only one side of the lot had a view with privacy, and a limited budget kept excavation and reinforced concrete walls to an absolute minimum. The house rests on top of the garage; the deck for outdoor living comes at the third floor, which just about meets the ground level of the rear of the plot. A sand-blasted glass window, 10 ft. wide and 20 ft. high, makes the stairs light and pleasant; it permits some view outward but preserves absolute privacy within. The house was built before the war, for a young working couple. The cost including built-in features, but not designer's fee, was $5509.16.



THIRD FLOOR

The structural system for exterior walls is 4 by 4 redwood posts, on 3 ft. 6 in. centers. Outside finish is stucco; inside, stucco, plaster and plywood. Floors are oak of plywood over sub-floor; in living and dining rooms they are carpeted; in bathroom and kitchen, linoleum

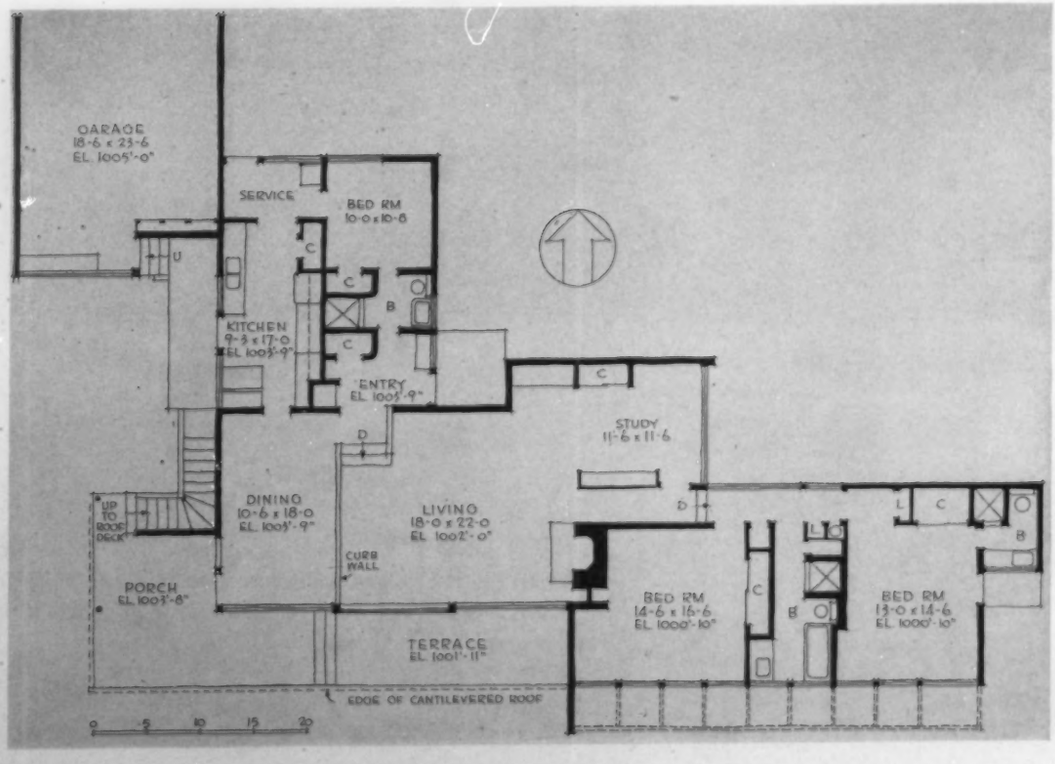
PLAN TO BUILD IN FOUR STAGES

Residence for Mr. and Mrs. Harry Schmidt, Pasadena

Richard J. Neutra, Architect;

Dion Neutra, collaborating

WITH building conditions as they are, the scheme this client is using will probably be frequently seen again. The house is designed to be constructed in several stages, a minimum house to get a roof over their heads, then additions as things loosen up. Step 1: just the service area, rear bedroom and bath, and what is shown here as dining space, to serve now as living room. Step 2: living room proper and study (the floor slab will probably be done before this step, to serve as an outdoor sitting area). Step 3: the additional bedroom just off the study. Step 4: the last bedroom and bath. The car shelter will fit into this doubtful-period plan as building conditions and budgets permit.



STORES

Architectural Record Building Types Study No. 110

THINKING of contemporary store design one can hardly resist the old classic about the excited general who "got on his horse and galloped off in all directions." That's where store design seems headed. And yet it makes much more sense than thus indicated. It is true that, with all of the freedom and ingenuity associated with modern design trends, designers seem bent on new experiments in excitement and insanity, with curves and kidneys and canvas columns and canted verticals and candy stripes, not to mention hearts and flowers. But it doesn't take much review of individual designs to see the reasons, case by case.

Generally speaking, there are two principal reasons:

1. Space problems. In many of the designs here shown crowding was unusually necessary. Mass merchandising cannot afford space in luxurious quantity. Also several different departments must be visually separated, causing the architect to mix devices and patterns in close quarters. Perhaps the significant thing is that the mass-selling type of store needs the services of capable designers like no other merchandising, and is leaning heavily on them.

2. The neo-Baroque touches are popular with the customers. Perhaps during the war period the customer was *not* always right, but in the matter of design appeals he is the arbiter. As a designer becomes more and more steeped in the atmosphere of mass merchandising, he is increasingly conscious of the public's response to the "fancy" decorations.

Visible in this situation is an interesting tendency to use the popular, traditional devices in new patterns and new textures, to put simple melodies in more modern rhythms for the entertainment of customers and the profit of clients.

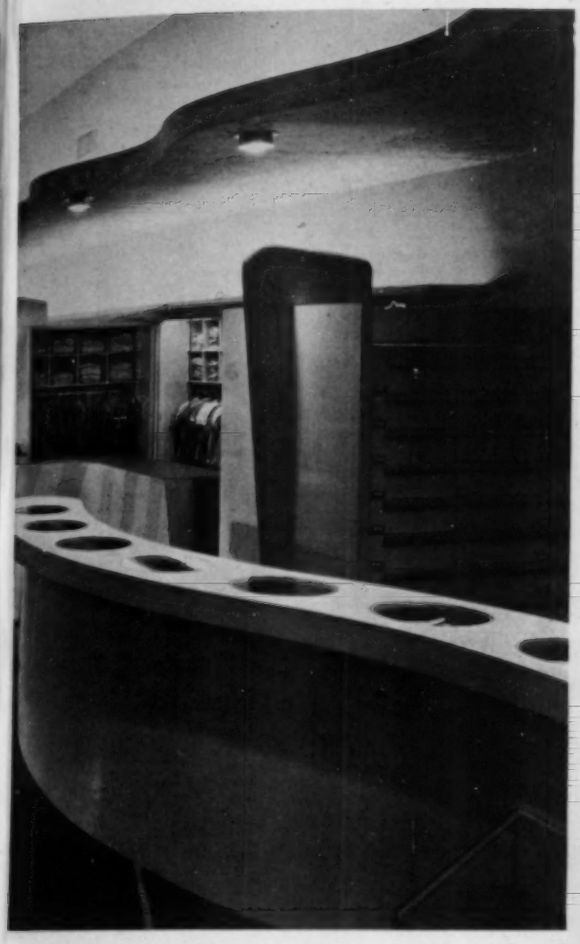
FREE-FLOW PLAN IN TIGHT AREAS

IN THIS store the architect had to pack a terrific quantity of merchandise into small spaces; in solving this problem he has given a fairly convincing demonstration of the merits of the free-flow idea in store planning, when such planning is strained to the utmost. Not only quantity of stock, but also variety of departments, complicated the designer's task. The store deals in children's clothing, which must be departmentalized not only by types of clothing but also by age groups. If the accompanying photographs, therefore, do not show a carriage-trade salon aspect of quiet spacious-

Rock-a-Bye Children's Clothing Store, Brooklyn

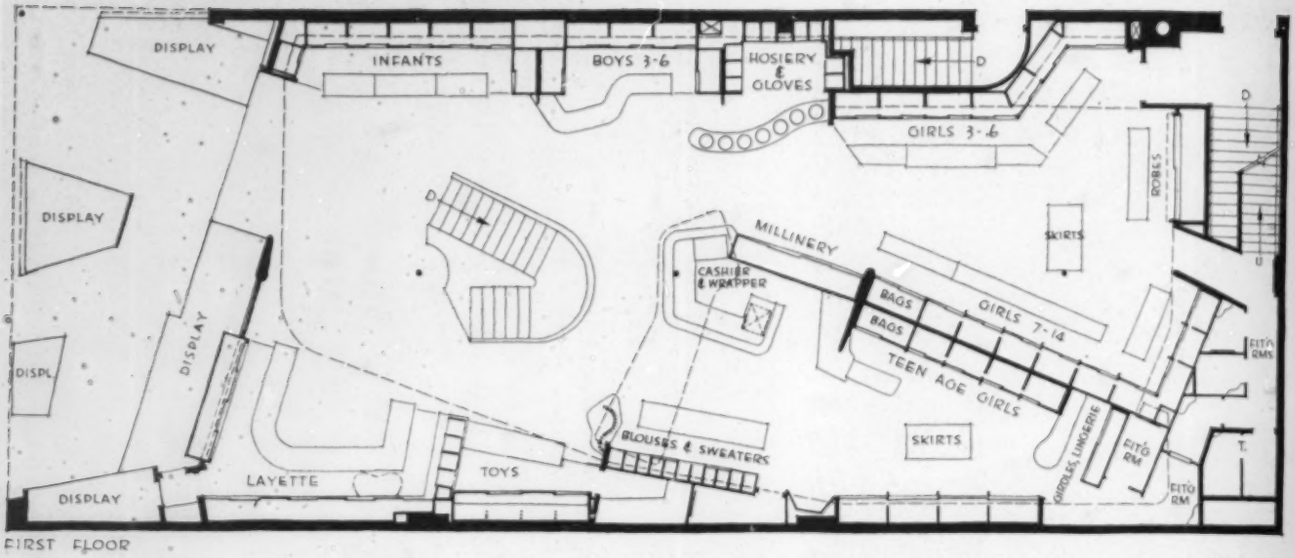
Morris Lapidus, Architect

Show windows, always a problem in a mass-selling store, were here complicated by the fact that a separate window was required for each of several age groups. The designer's answer was an angled front recessed to permit two side windows, one large main window, and two free-standing units



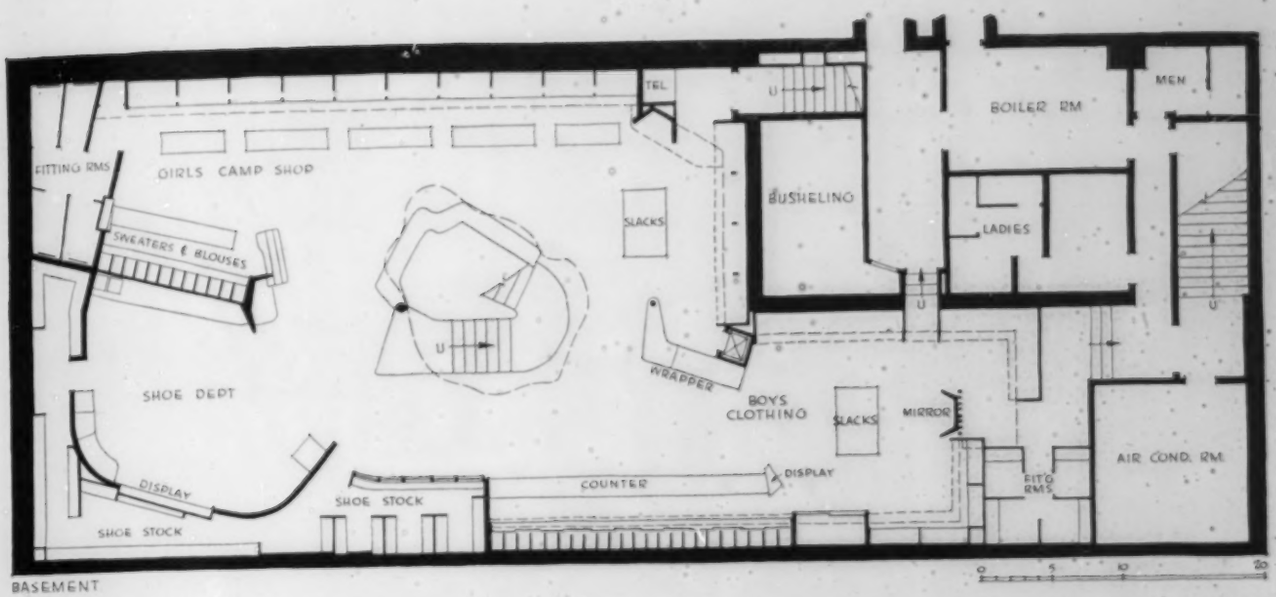
GOTTSCHO-SCHLEISNER Photos

At the hosiery and glove department the architect has introduced a counter device to add still another merchandising idea for this small area. The curving counter, besides exerting a pull toward this department, further entices the customer by displaying ensembles in the holes in the counter top.



FIRST FLOOR

ness, they do show something of the design challenges that will probably confront store architects increasingly in the busy days ahead. For mass-merchandisers seem to be turning more frequently to the design talent that has proved itself first in more leisurely surroundings. The several different departments also posed a problem in the show-windows — there must be a separate window for each age group of children. Thus in a front of less than 40 ft. there are five show cases or windows. A more typical problem, last but not least, was that of leading customers down the stairs to basement departments (p. 105), and in spite of the crowding the architect has managed to keep the stairs in open space.


TEL
U
BOILER RM
MEN
FITTING RMS
GIRLS CAMP SHOP
BUSHELING
SLACKS
LADIES
SWEATERS & BLOUSES
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WRAPPER
SHOE DEPT
BOYS CLOTHING
SLACKS
MIRROR
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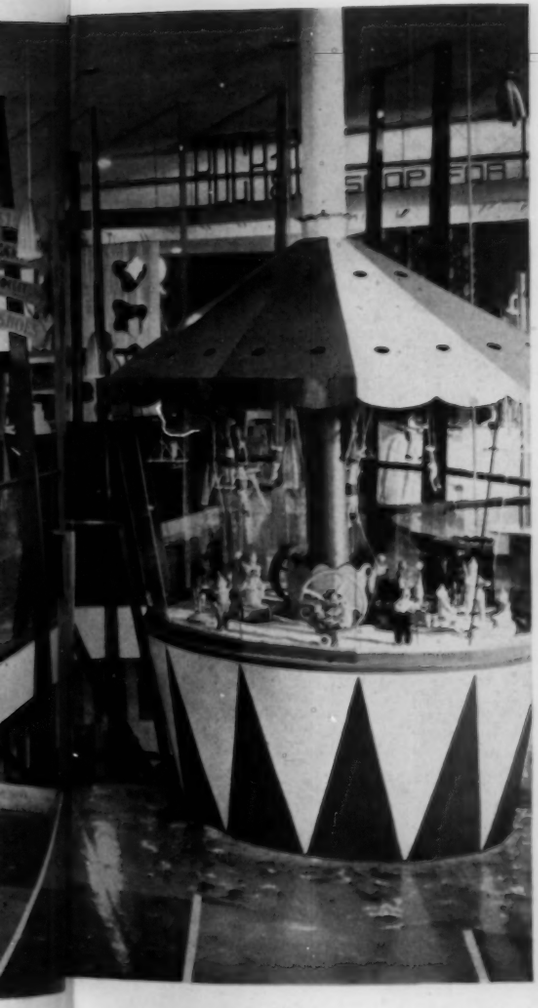
BASEMENT



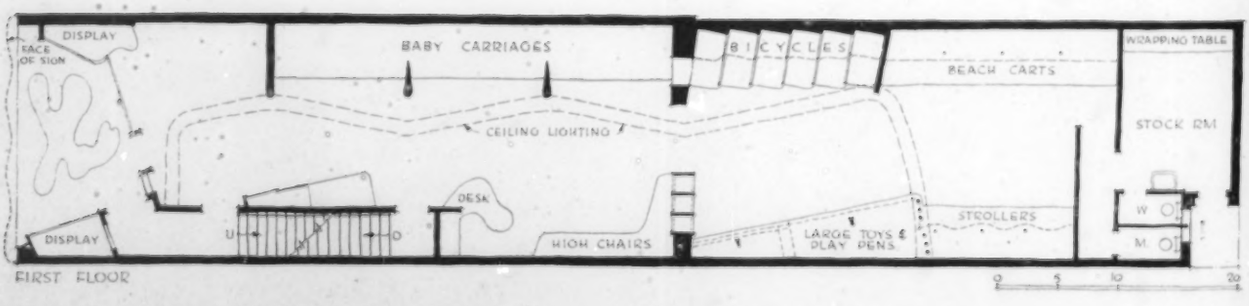
The Rock-a-Bye store also presented the problem of enticing customers to the basement departments, via the stairs. The designer has used many devices for this. The stair was made the focal point of the only really open space in the store, invitingly near the entrance, with floor lines directing the customers' footsteps. Signs point him downwards; the vertical tie rods seem to speed the process. And the stair is screened around the rear with a sort of smoke baffle, until it almost seems that the main part of the store is in the basement.

SMALL STORE FOR LARGE DISPLAYS

Rock-a-Bye Children's Furniture Store, Brooklyn

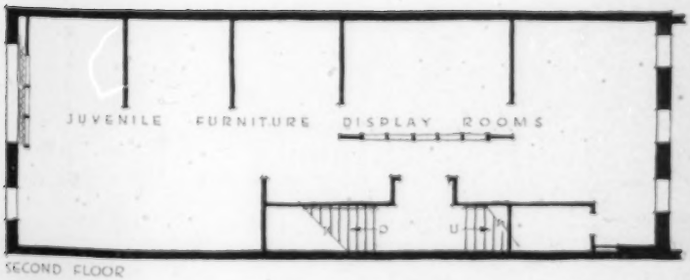
Morris Lapidus, Architect

THIS store offered at least the same problems as the foregoing one. Indeed it is another store of the same concern, this one selling children's furniture and large toys instead of children's clothing. If anything the space problem here was even worse, because of the large sizes of the merchandise, and because of the narrower proportions of the store. In this one the second floor provides additional selling space, in place of the basement, and the task of getting customers upstairs was not easy since the stairs were at the side. Thus the front is canted toward the stairway entrance, with separate doors leading to main floor. On the main floor, stalls for

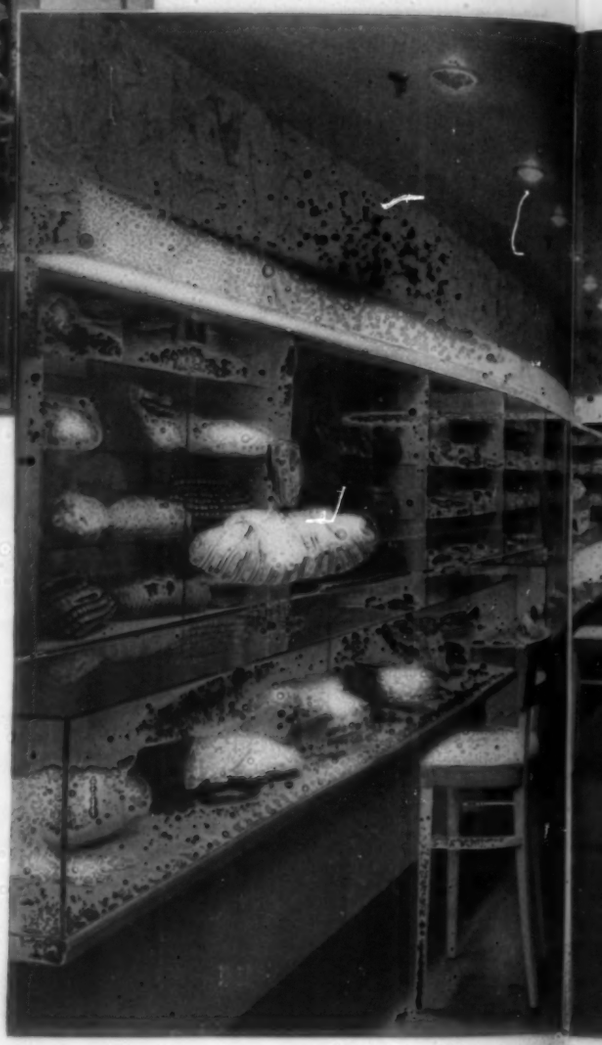


GOTTSHO-SCHLEISNER Photos

the baby carriages brought some order to a rather chaotic confusion. A similar arrangement farther along the same side makes an orderly display of bicycles. Smaller items of furniture are displayed in a similar manner along the opposite wall; here a narrow eye-level platform in mezzanine style adds merchandising space without hiding other items. Still smaller but nevertheless bulky items are stocked in cubby-hole shelf arrangements, which utilize space intensively but keep the merchandise plainly visible. And the designer has brought in an unusual number of styling devices and eye-catchers to brighten the long, narrow store.



SECOND FLOOR



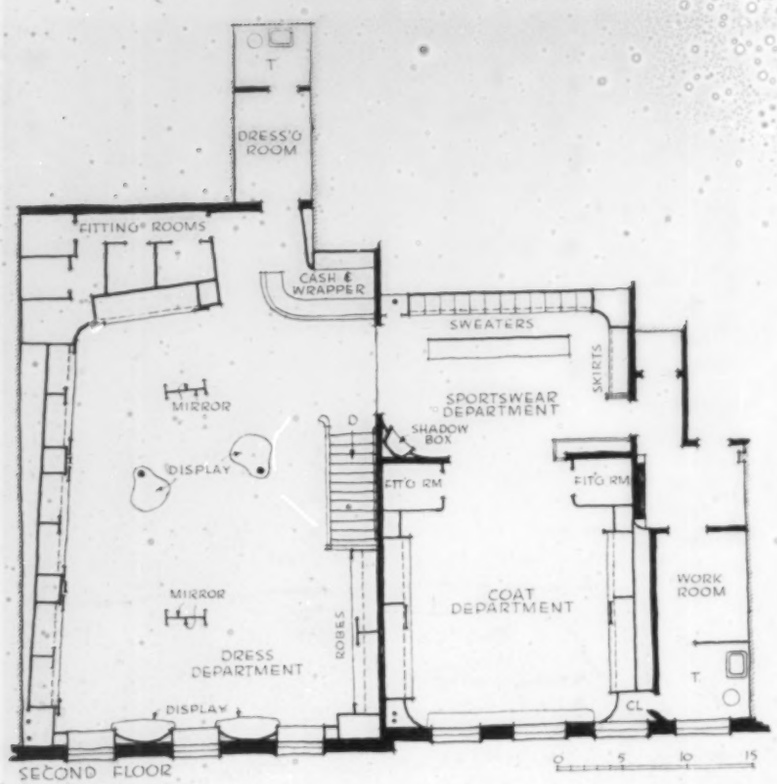
INGENUITY IN SMALL SPACES

Pat Darling Shops, Baltimore

José A. Fernandez, Architect

IN MODERNIZING this old store, the architect was confronted by many of the same handicaps mentioned on the preceding pages. Here crowding was a necessity on the first floor, since the ground floor location consists of one narrow strip. Construction difficulties were very real; the buildings were more than a hundred years old, originally built for residences. There were different floor levels on the wider second floor portion; the fronts did not line up; the stairs came out on the building line, and had to be moved back within the store. The budget consideration was important. In short, here was an assignment ready made for the ingenuity that characterizes contemporary design.

Color scheme for the first floor includes rose, gray, and white in a specially printed wallpaper for background, royal blue linoleum on the floor, pickled oak fixtures. The ceiling is done in a pale rose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DRESS'G ROOM
FITTING ROOMS
CASH & WRAPPER
SWEATERS
SKIRTS
SPORTSWEAR DEPARTMENT
MIRROR
SHADOW BOX
DISPLAY
FITG RM
FITG RM
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COAT DEPARTMENT
WORK ROOM
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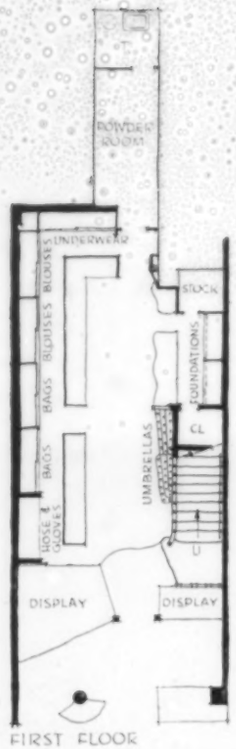
SECOND FLOOR

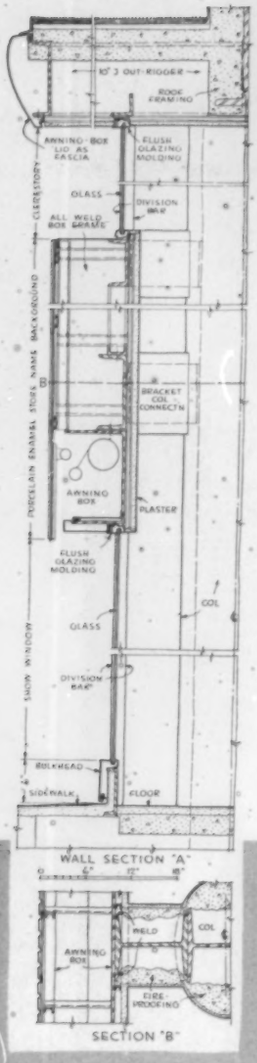

POWDER ROOM
UNDERWEAR
BLOUSES
BLOUSES
STOCK
FOUNDATIONS
BAGS
BAGS
UMBRELLAS
CL
HOSE & GLOVES
DISPLAY
DISPLAY
FIRST FLOOR

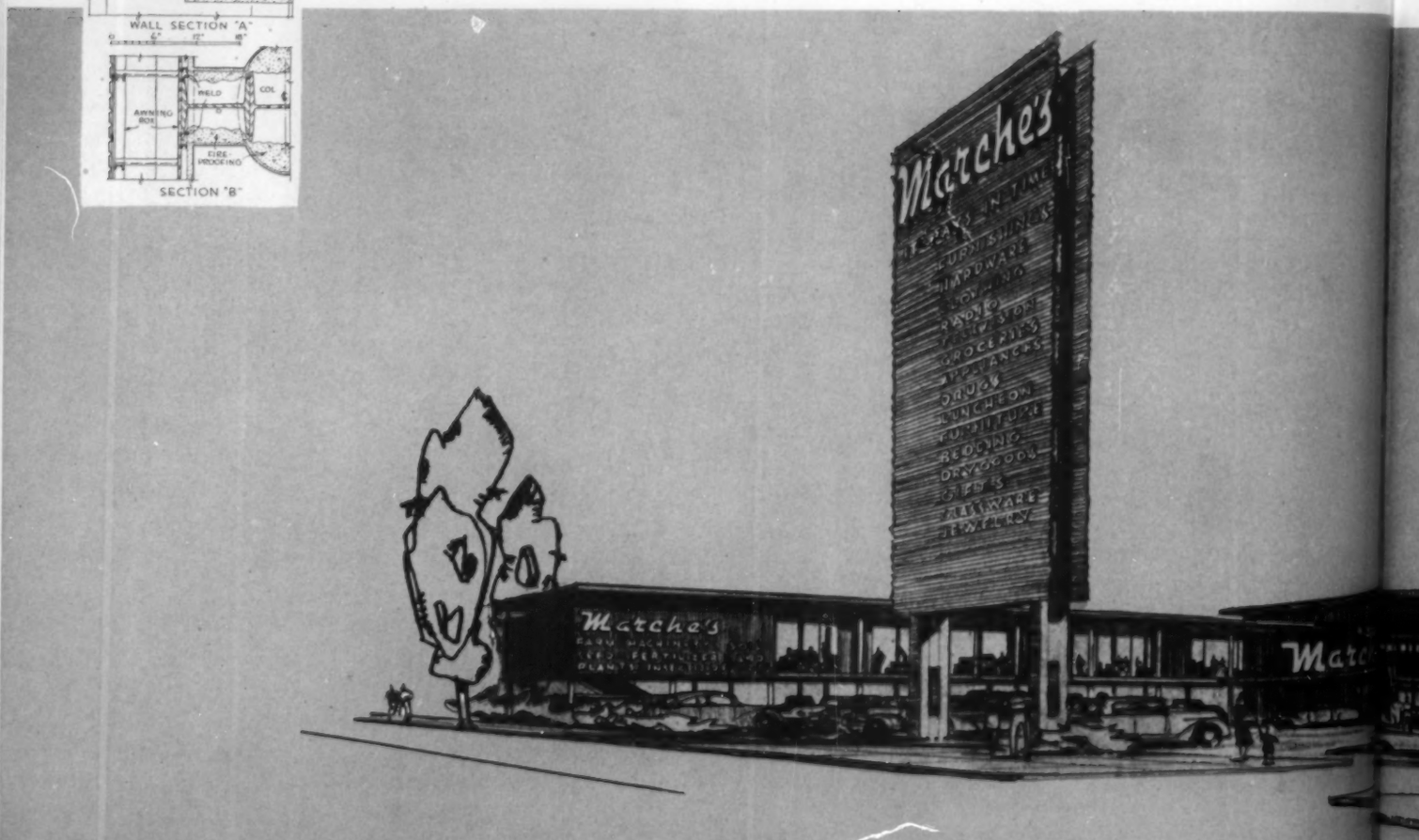
In the dress department (right) color scheme is gray, yellow, white and blue. The yellow appears in large squares in the floor linoleum. Borders around cases are wallpaper, in marble pattern. In other departments, the yellows and grays continue; the contrasting color is green

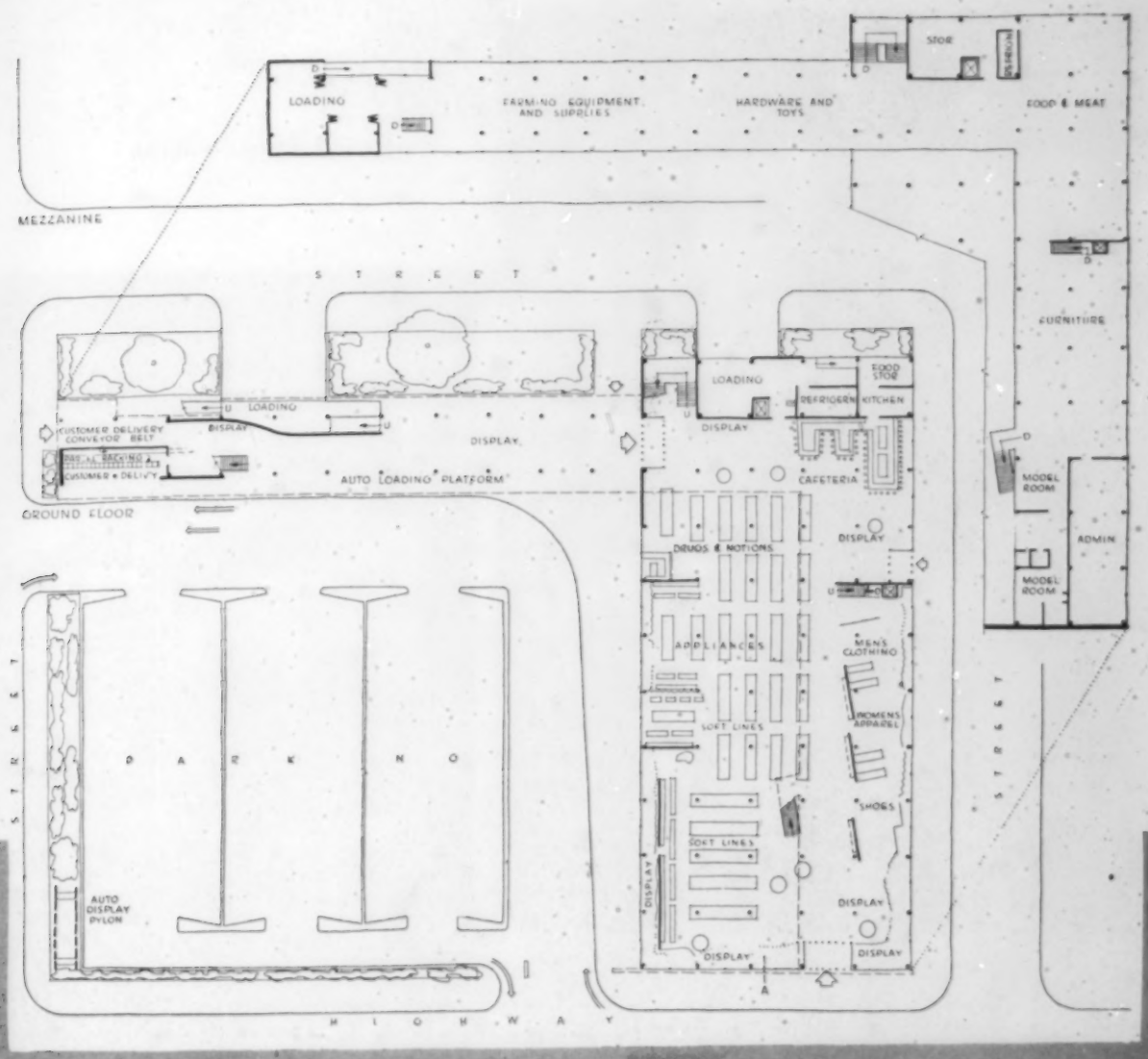
DEPARTMENT STORE FOR A HIGHWAY LOCATION

Designed for The Kawneer Company by Ketchum, Giná & Sharp, Architects

SOMETHING new in the store field is a highway department store, placed out in a country location for the convenience of the motorized farm trade. Super-markets have been creeping outward from cities for years; retail outlets of mail order houses have been somewhat bolder. This suggested store would make the final leap. It would sell everything from farm equipment to lingerie for the womenfolk. It was logical to introduce some design innovations: heavy emphasis on display in second-story windows, where farm equipment would get good attention from passing cars; a flexible system of movable panels, to be rearranged at will with merchandising shifts. The plan gives some idea of the possibilities resulting from complete freedom from site limitations.






LOADING
FARMING EQUIPMENT AND SUPPLIES
HARDWARE AND TOYS
STOR
REFRIGN
FOOD & MEAT
MEZZANINE
STREET
FURNITURE
LOADING
FOOD STOR
REFRIGERN
KITCHEN
CUSTOMER DELIVERY CONVEYOR BELT
DISPLAY
LOADING
DISPLAY
DISPLAY
AUTO LOADING PLATFORM
CAFETERIA
MODEL ROOM
ADMIN
GROUND FLOOR
DRUGS & NOTIONS
DISPLAY
APPLIANCES
MENS CLOTHING
SOFT LINES
WOMENS APPAREL
SHOES
SOFT LINES
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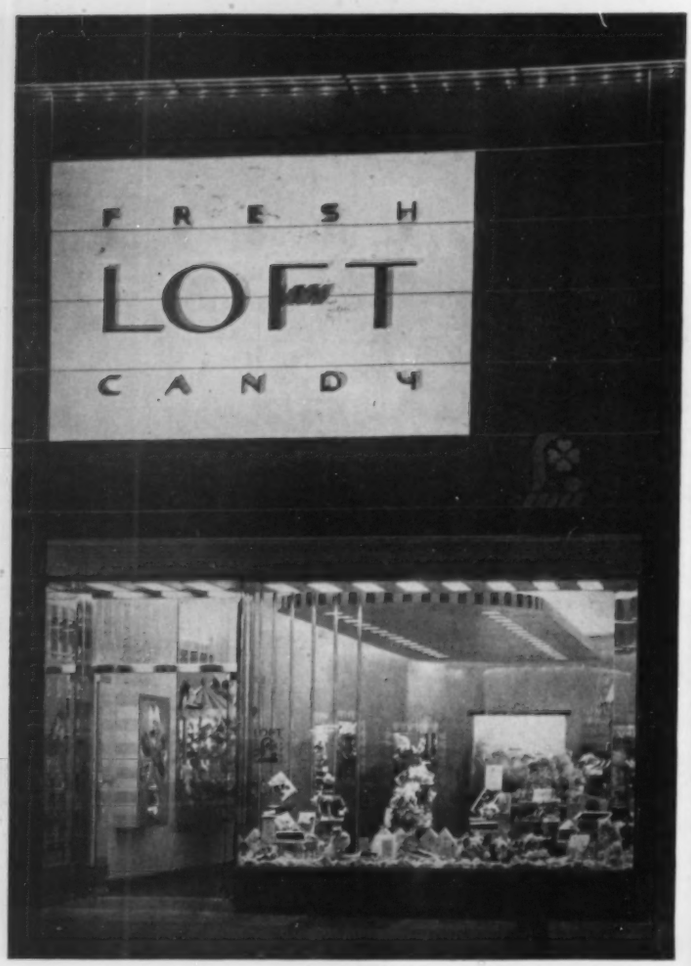
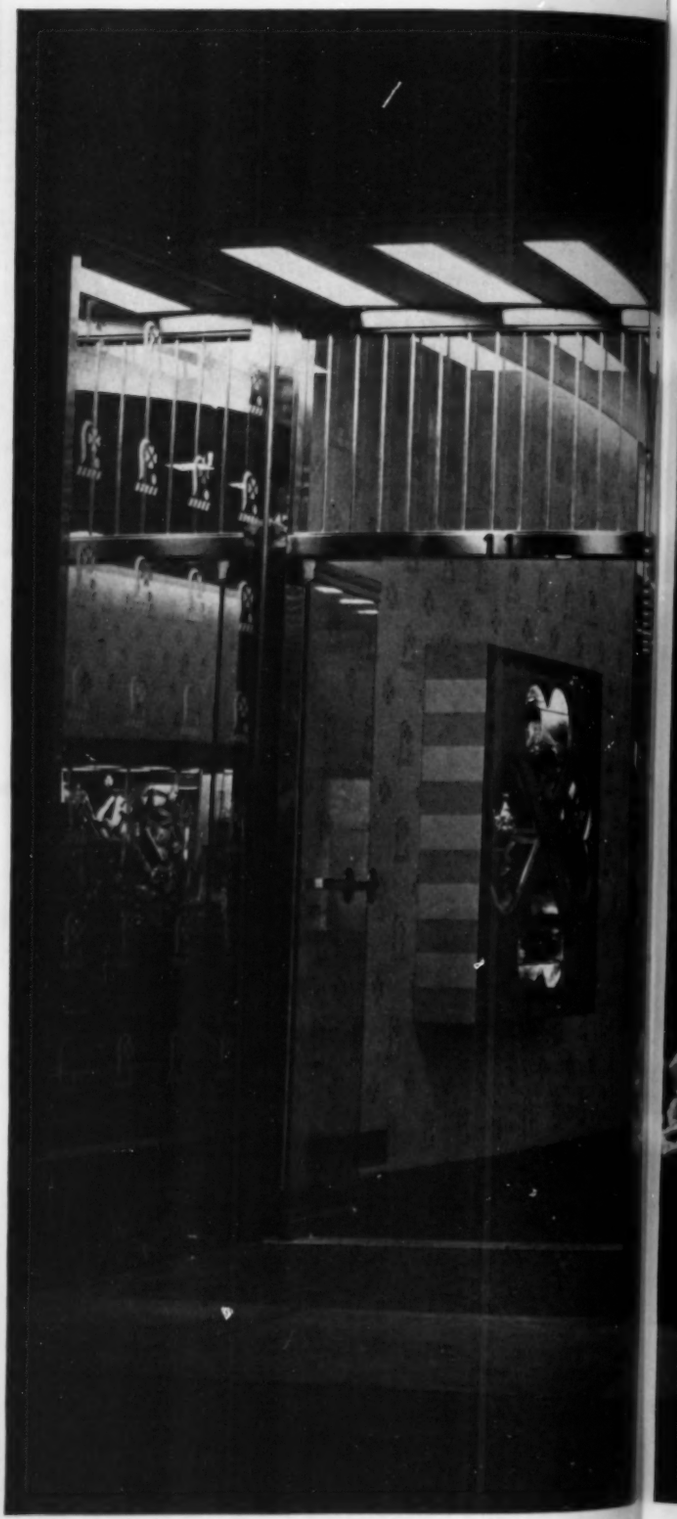
H I G H W A Y

Marches



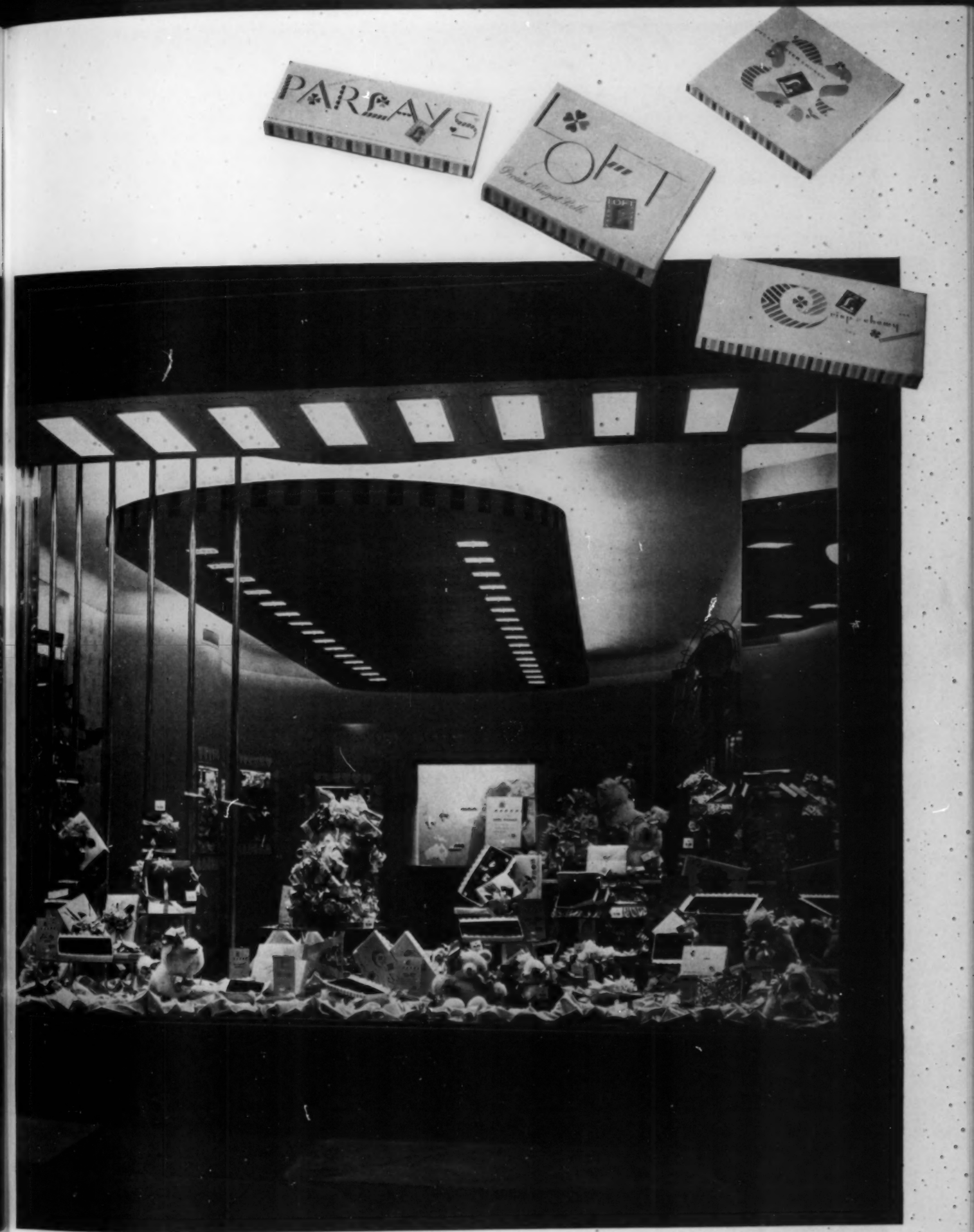
Charles C. S. Dean, Designer



PACE-SETTER FOR A CANDY CHAIN

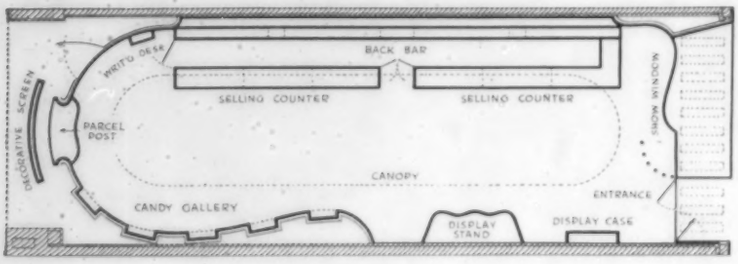
Loft Candy Store, 42nd Street, New York

CONSIDERABLE interest attended the recent opening of Loft's candy store on New York's 42nd Street. To Loft it was a pace-setter and model for the reconversion of its 175 store units, with new design motives, new trademarks, new selling appeals. To designers it proved at least equally interesting as a sort of modern integration of soft touches — hearts and flowers motives, peppermint stripings, a "sane yet unsane" (Dean's phrase) "organic pattern" which manages to have a "bandbox tidiness." Focal part of the trademark is a cloverleaf made up of four hearts, intended to represent freshness of the candy. Other novel ingredients: a striped candy bar forming the horizontal stroke of the F, a candy bar as the bottom of the L, a leaf motive for its



COMMERCIAL ILLUSTRATOR'S Photos

vertical stroke. These are interwoven in the design, occasionally used boldly, sometimes muted in the texture of wallpaper or background. All is done in a three-color scheme of gold, sky-blue and coral rose, with some beige-gray for backgrounds. All of these devices are carefully calculated for merchandising value, and the design as a whole contains many little horizontals leading into the store, and works hard to set notes of charm and gaiety. If it all sounds whimsical and playful, it comes as the result of much study of Loft stores and their customers, leading the designer to tackle a blend of the old symbols with the newer concepts of design.



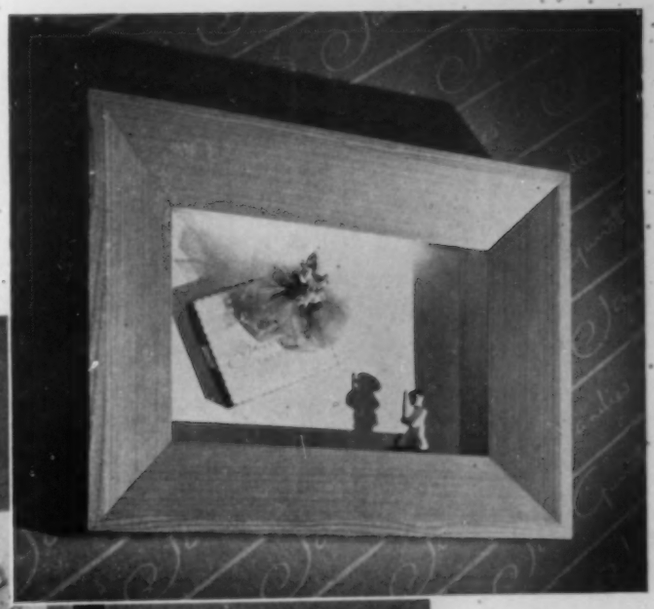
PIONEER DESIGN FOR CANDY SHOP

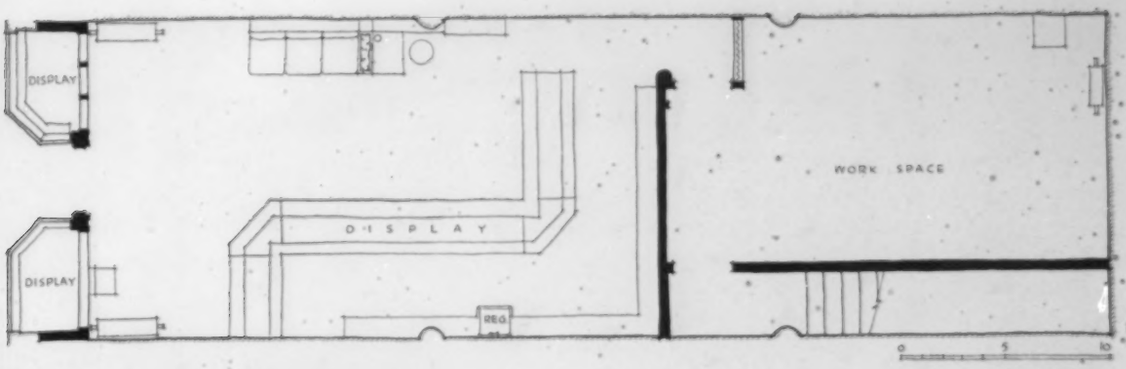
First Retail Outlet for Garrott Candy Co., St. Paul
Harold Spitznagel, Architect

ANOTHER pioneering design, this one sets the pace for a successful candy manufacturer making his first venture in retail selling; this is to be the first of a modest chain of retail outlets to bear the firm name. Naturally the manufacturer wanted a note of clean quality. The cleanliness idea suggested the white front, easy to keep scrupulously spotless. The name script is in vermilion. The clean lines of the interior and the show case will do no harm in this respect. The case is of faun colored ash. It is lighted from within with cold-cathode tubes. Walls are plastered; mostly in gray, but one wall is done in chrome yellow, as is also the acoustical ceiling. The settee too is yellow.

HEDRICH-BLESSING Photos

The shadow-box, this one lighted from within, makes an effective display for the candy box designed by the architect, particularly with the little figure for an eye-catcher. The background here is the canvas wall covering with the firm name and the diagonal stripes in white on gray tone

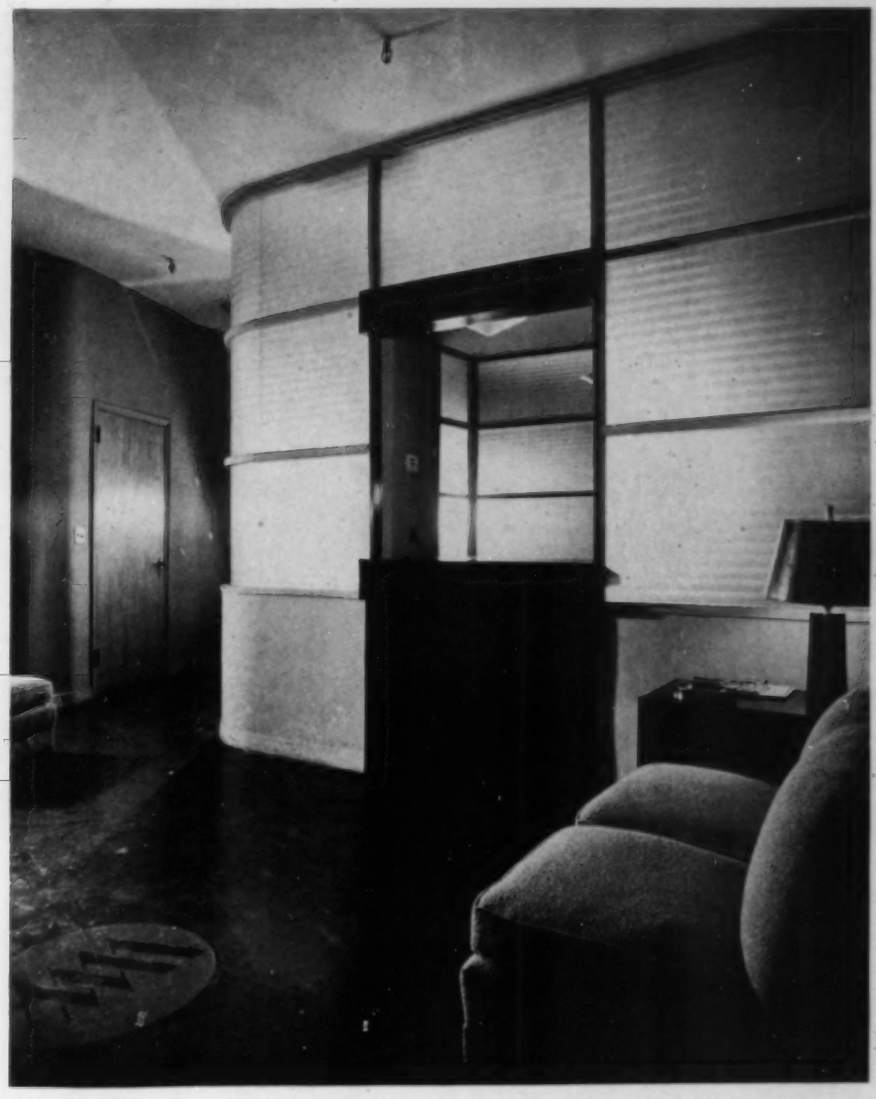




The yellow bench is given a touch of psychological separation by the island pattern in the flooring and by the mirror panel behind. There is more than a suggestion of privacy for the writing desk in the plants that block it off from the bench, perhaps inspiration too

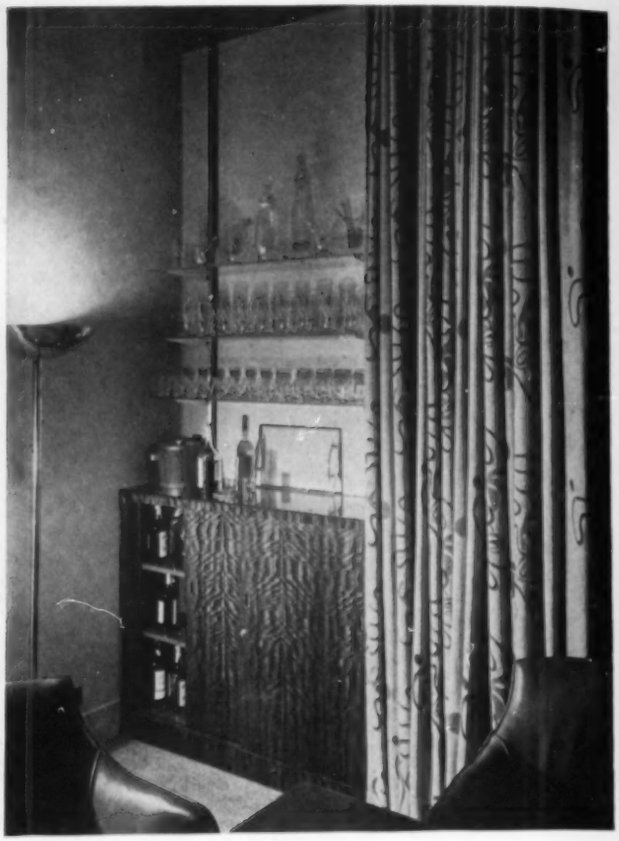
SHOWROOM FOR WOOL FABRICS

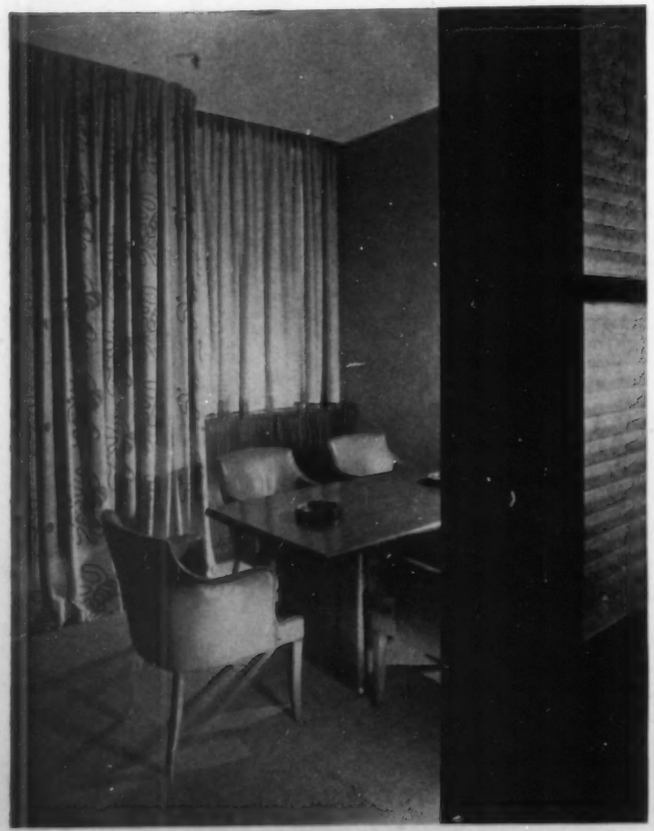
Moniteau Mills Showroom and Offices, New York
Robert Gruen Associates, Designers



IF THE influence of capable design talent is being felt more and more in the retail world, it is also increasingly demanded in the wholesale showrooms. Here there is a different level of salesmanship, and the difference is reflected in the designs. At any rate New York's showrooms have recently been "reconverting" for an era of competitive selling which should be just around the corner, and the interior walls of the city's ancient loft buildings are being hidden behind bright modern materials.

The hiding process frequently, as in this case, calls for considerable ingenuity. This was old-fashioned space, with ceilings over 13 ft. high. The new ceiling was dropped — accommodating air conditioning ducts — until it came below window height. The extra height was also utilized for recessed lighting, and to form a pocket for drapes and curtains. Since this is a showroom for woolen fabrics, lighting took on exceptional importance. Good north light is the natural requirement; thus show tables are placed to take advantage of daylight. For the dark days, the tables are lighted with a

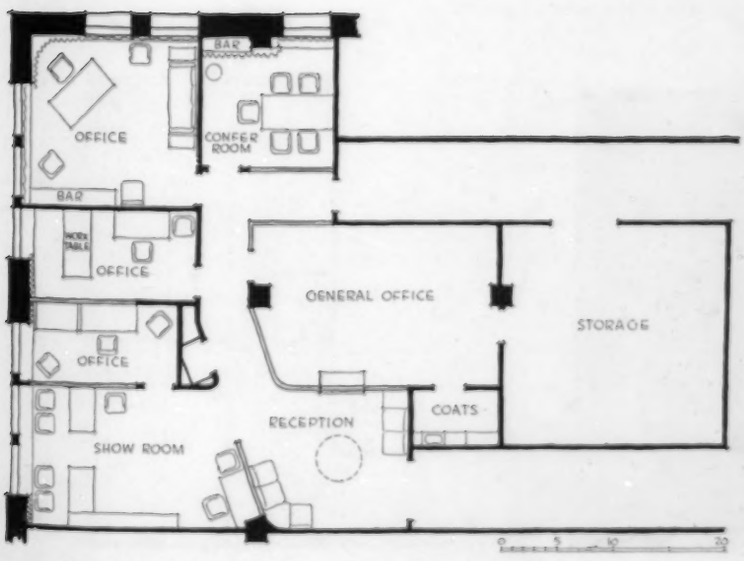


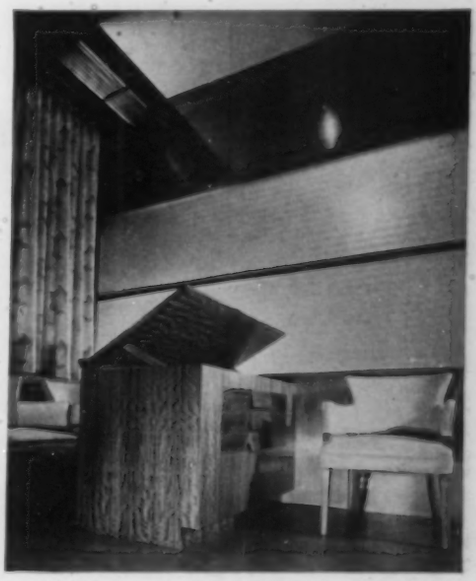


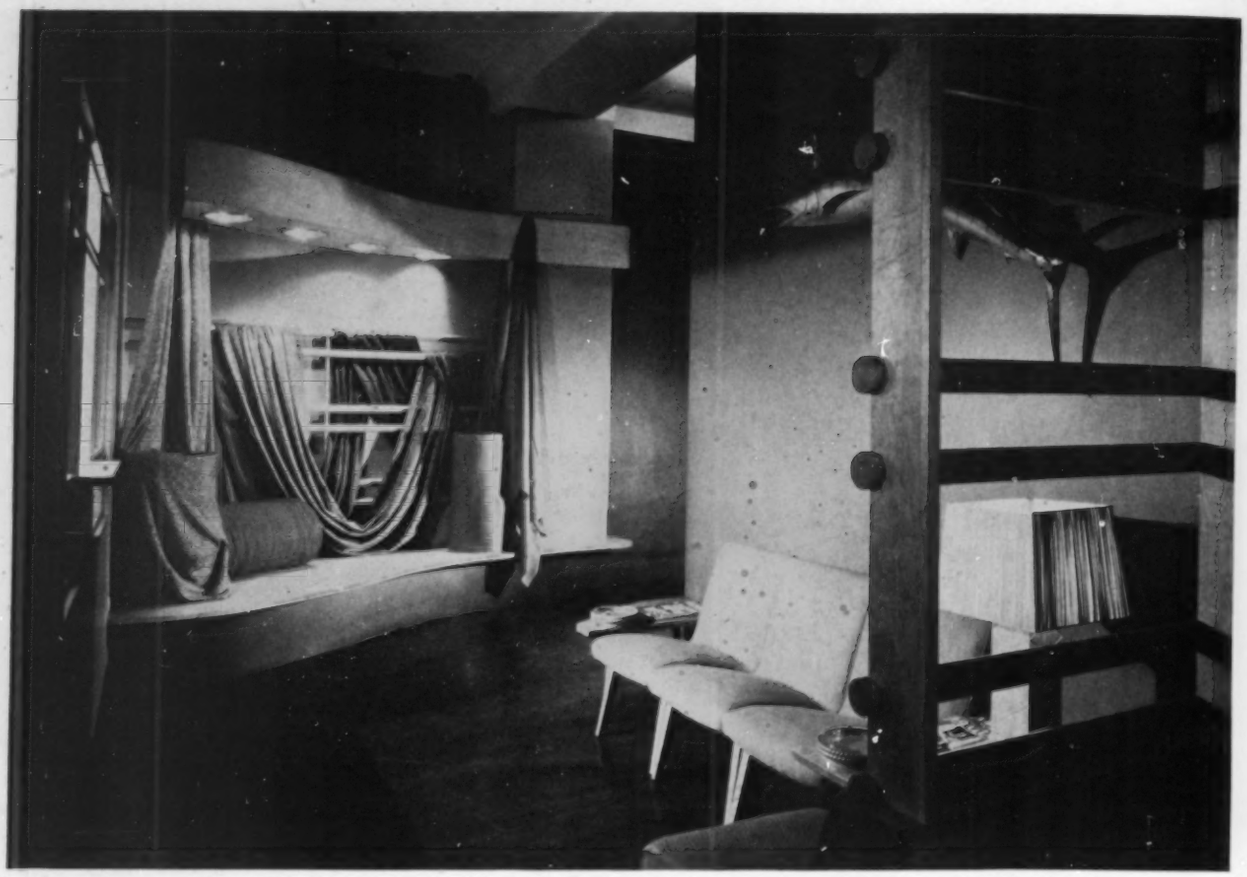
combination of direct and indirect lighting, the fluorescent installation combining soft white and gold tones, for a close-as-possible approximation of daylight.

The show tables were designed for the sales methods employed by fabric salesmen; the table top is covered with fabric, and tilts up. The customer is seated at the table; the salesman stands on the other side, pulling swatches out of the drawers (see photograph above).

The reception room is done with a photomural tying in with the topic of woolens; dark blue linoleum floor with terra cotta inlay of the interwoven double M, the firm's trademark which was part of this design assignment. The Gruens also did the decorating, even to the glassware in the president's private cabinet.





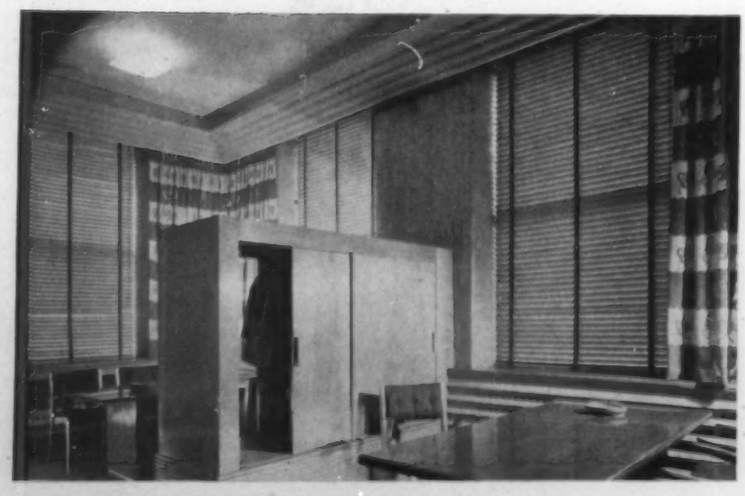


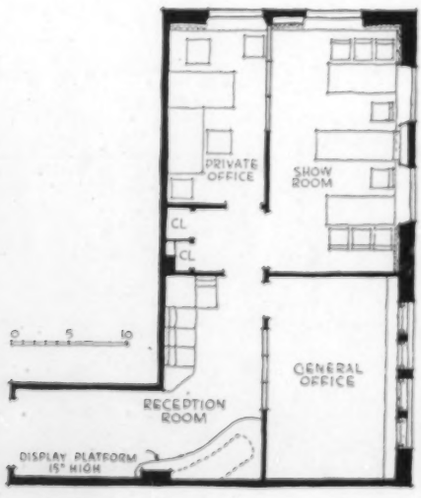
SHOWROOM FOR BOYS' CLOTHING

Office and Showroom for Windsor Clothing Company, New York City

Robert Gruen Associates, Designers

As stated by the designer, the problem here sounds typical — to design a cheerful, colorful interior in a limited space. The long corridor portion of the reception room added a little problem of leading the visitor invitingly around the corner. The curved display was used for this purpose, its platform exhibit brilliantly lighted to attract instant attention. The ladder rungs and lighting fixtures in the reception room are of blonde maple; linoleum floor is dark green, as are also one wall of the reception space and the corridor portion. Opposite walls are gray. Bright red upholstered chairs are set against the green wall. The same color scheme is used also for the showroom section.





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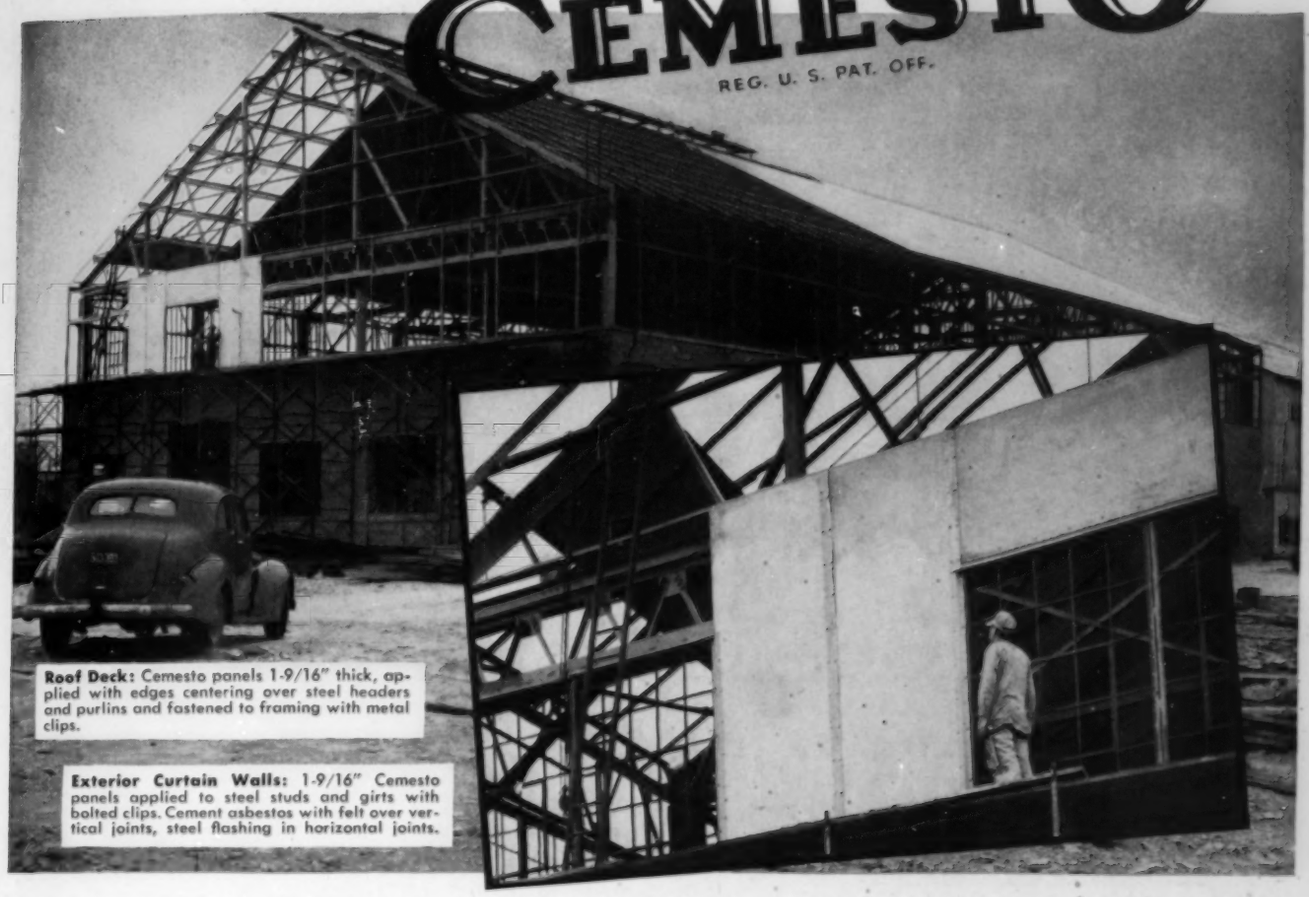

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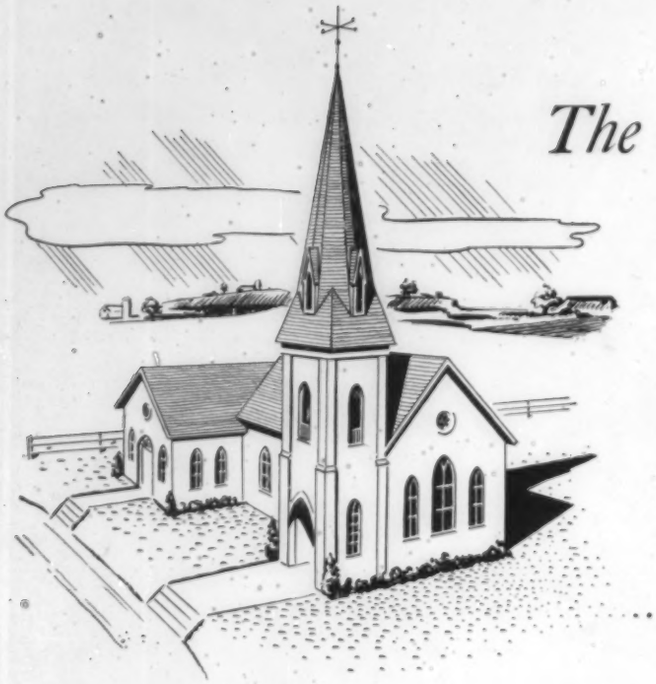

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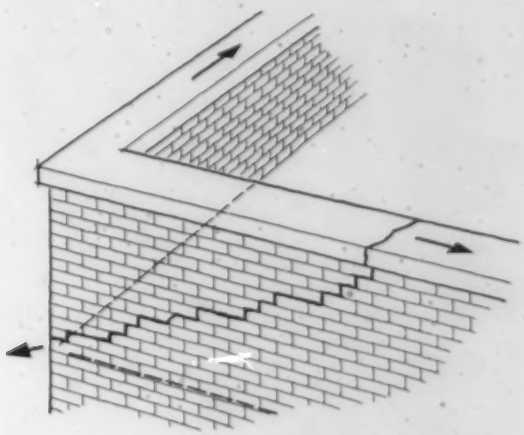
ARCHITECTS desiring to learn more of the space-saving, money-saving features of this new Wurlitzer Orgatron are invited to write the Orgatron Division of the Rudolph Wurlitzer* Company, Dept. 1103 North Tonawanda, New York. *The Name That Means Music to Millions.

"THE ONLY ELECTRONIC ORGAN WITH TRUE CHURCH ORGAN TONE"

PARAPET WALLS

Several methods of obviating cracks in parapet walls put to use and tested by Fred N. Severud, Consulting Engineer

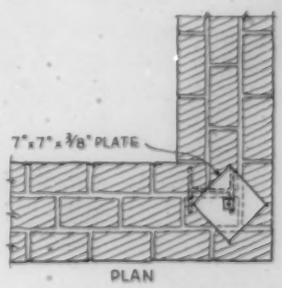


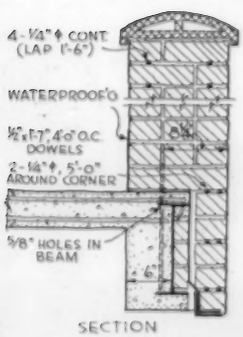
The natural struggle between the inside and outside portions of a wall becomes most intense at the juncture of roof and parapet wall. It is not at all unusual for the struggle to go on until there is, literally, an explosion. Indeed, cracked or broken parapet walls, particularly at roof corners, are quite common.

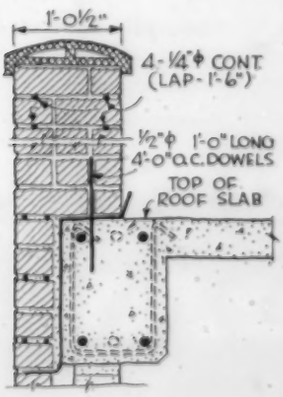
Every wall of any thickness is strained by the differences in exposure and temperature between inside and outside. The outer surface, or outer layer, gets wet and then is heated by the sun, or, more to the point, it is subject to freezing temperature while the inner layer is heated. Thus the outside layer wants to contract, the inner one to expand. Sooner or later each goes its own way and an explosion follows, leaving a break in the wall.

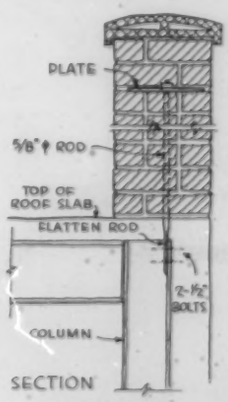
If this is a factor to be taken seriously in wall construction, and it is, it is even more worthy of consideration in the design of parapets. For here the difference reaches the extreme, above the point where the outside wall gets any heat at all from inside. Heat in the top story rises to the underside of the roof slab, causing it to expand. Insulation on top will free the slab from the influence of the cold outside, and the slab will stretch comfortably. But the parapet

Standard details used in the office of Fred N. Severud, structural engineer, for tying the parapet walls against temperature strains. Steel rods run continuously through the wall itself and the brick courses immediately below it with steel dowels tying the wall to the spandrel beams









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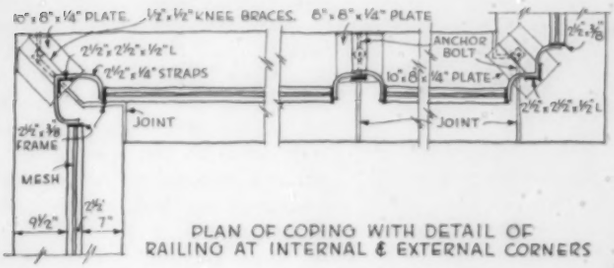
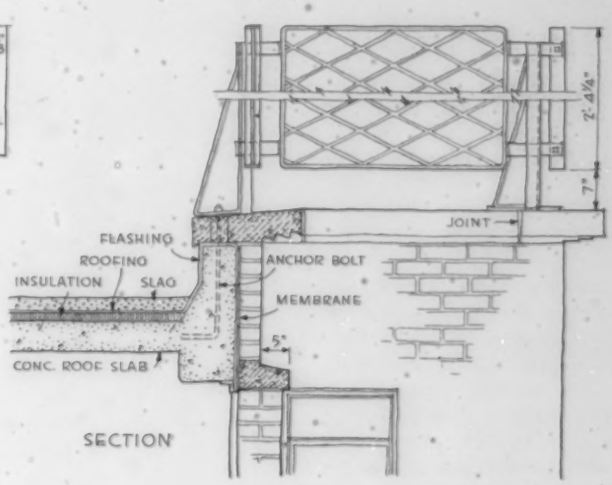
PARAPET WALLS

(*Continued from page 129*)



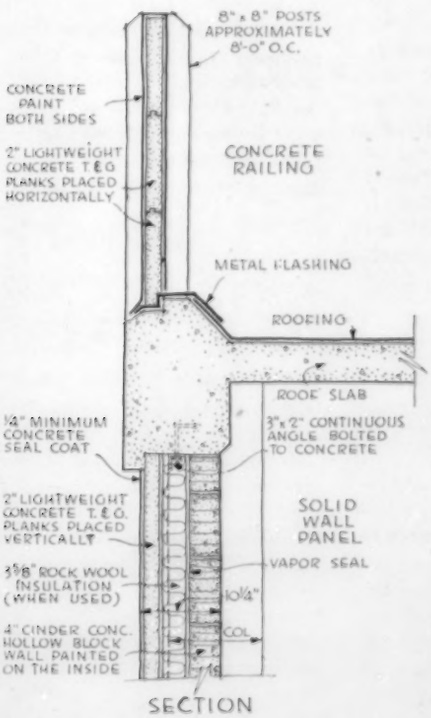
PLAN OF COPING WITH DETAIL OF RAILING AT INTERNAL & EXTERNAL CORNERS



SECTION

One way to prevent breaks in the parapet wall is to eliminate the wall entirely. Details of steel railing developed by Voorhees, Walker, Foley and Smith, architects, for East River Housing Project

Here a concrete fence is substituted for the parapet wall. Concrete struts poured with the spandrel beams act as fence posts. Pre-cast concrete planks, set in slots in the posts, form a crack-proof wall


8"x8" POSTS APPROXIMATELY 8'-0" O.C.
CONCRETE PAINT BOTH SIDES
2" LIGHTWEIGHT CONCRETE T&G PLANKS PLACED HORIZONTALLY
CONCRETE RAILING
METAL FLASHING
ROOFING
ROOF SLAB
¼" MINIMUM CONCRETE SEAL COAT
3"x2" CONTINUOUS ANGLE BOLTED TO CONCRETE
2" LIGHTWEIGHT CONCRETE T&G PLANKS PLACED VERTICALLY
SOLID WALL PANEL
VAPOR SEAL
3⅝" ROCK WOOL INSULATION (WHEN USED)
10¼"
4" CINDER CONC. HOLLOW BLOCK WALL PAINTED ON THE INSIDE
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SECTION

wall, out in the cold, will shrink from each free end, toward the center. Now the "free" applies only at the top of the wall; the bottom is fixed at the roof line. At the corner, the pull is along each wall. The roof slab is pushing the bottom corner of the parapet wall outward; the top of each wall is being pulled inward. Thus the corner cracks often take the pattern in the sketch on the preceding page.

The sections on the preceding page show the standard practices of Mr. Severud's office, in three normal types of construction. For tensile strength, steel rods are run through the parapet brick courses, also for a few courses in the facing below the roof line. The rods overlap at the joints to form continuous tie lines around the building. Steel dowels tie the walls to the spandrel beams, and plates embedded in the walls at the corners add rigidity there. This system ties the walls firmly in place; if minor cracks do develop, at least the walls will not jump out.

On this page there are two ideas which solve the problem by avoiding it completely. The details above were developed by Voorhees, Walker, Foley and Smith, architects, for the East River Housing Project, New York; they simply eliminate the parapet wall, substituting a metal rail on a low curb.

In the section below, a concrete slab fence is substituted for the parapet wall (here with precast slab wall construction). It is obvious that the concrete planks, set in posts, cannot carry temperature strains beyond the posts.

REQUIRED READING

HOUSES

The Book of Houses Planned for Beauty and Utility at Low Cost. 150 photographs, 100 plans for $5,000 to $10,000 homes. By John P. Dean and Simon Breines. New York 16, N. Y. (419 Fourth Ave.), Crown Publishers, 1946. 8½ by 11 in. 144 pp., illus. $2.00.

Anyone who has read Dr. Dean's recent book, *Home Ownership: Is it Sound?* (see AR, July, 1945, p. 128), will find the first few chapters of the current volume thoroughly familiar. Dr. Dean still warns constantly and convincingly of the dangers inherent in buying or building a house. It is a little curious, therefore, to find him teaming up with an architect in the production of a book on house planning.

The team is a happy one, however. The sensible, albeit discouraging, warnings of Dr. Dean go very nicely with the architectural understanding and logic of Simon Breines. In their preface these authors say that they are addressing their ideas to prospective purchasers of homes in the $5,000 to $10,000 class. They explain that most of the houses they have included are traditional in style because (1) most of the homes to be found for sale *are* traditional, (2) most people prefer such homes, (3) there is no point in including primarily modern houses when they are so hard to find, and (4) the good modern design is slanted at the $20,000 to $30,000 pocketbook. All very sensible. The houses themselves are sensible, too — well planned, most of them, and varying widely in both size and style. They are not presented as a portfolio from which the would-be home owner can select the house of his dreams, but as a handbook from which he may glean an idea here and another there to be incorporated into his ideal home.

This is a book that the prospective home owner will really find useful. The text covers every imaginable subject — from check lists and risks, costs and purchase plans, legal pitfalls and home safety, to "purchasing a neighborhood," making the most of the lot, the plan, remodeling, the basic house, prefabs, and weekend cabins. Photographs and plans are liberal in number, adequate in size.

It is unfortunate that more care was not taken with the appearance of the book itself. The photos are all a wishy-washy gray, many of the plans are blurred.

HOME BUILDING

Make Your Home Your Hobby. By Walter J. Coppock. Yellow Springs, Ohio, The Antioch Press, 1945. 6 by 9 in. 92 pp. illus. $1.50.

Contrary to the implications of its title, this is not a handbook of ideas on interior decorating, but another of the rabbit-like homebuilding-manual family. The hobby part of the title refers to the fact that the book is intended primarily for the person who wishes to do his building with his own hands.

Because of its intended audience, the book contains a good bit of practical information, much of it perforce rather elementary. Not enough attention is paid, however, to the problems of design. What little mention of design is made is usually on the negative side — such and such is "not good design."

Mr. Coppock, an engineer, is much more concerned with materials and workmanship than he is with plan. A good part of his book is given over to the technical: walls, stairs, piping, and so on. There is a whole chapter devoted to air conditioning, and another dealing exclusively with the reduction of building costs. Just one short chapter is given over to interior planning, and this is merely a description of three rather ordinary little houses, all very much alike. One of them is the author's own.

BRITISH BUILDING

Architects' Year Book. Jane B. Drew, F.R.I.B.A., ed. London, E.C. 1 (Diamond House, 36–38 Hatton Garden), Paul Elek, Ltd., 1945. 7½ by 10 in. 412 pp. illus. 35 s.

The aim of this volume, says the editor in her foreword, is "to show trend and to help the forward-looking architect by giving him the necessary background of basic contemporary knowledge." With this end in mind, 13 papers are presented on various subjects ranging from landscape architecture and town planning to housing, planning industrial buildings, and service buildings. A technical section includes 16 papers on such items as structural steel, reinforced concrete, fiber building boards, plastics, acoustics, glass. To many of the articles are appended bibliographies and reference lists.

CITY PLANNING

OHIO

Comprehensive City Plan. By the City Planning Commission, Greenville, Ohio. 8½ by 11 in. 92 pp. illus.

The aerial view which comprises the frontispiece of this planning report shows Greenville to be a city of long straight streets bisecting each other for the most part at right angles. More than the usual number of trees is evident, and there is one square, with a city hall at its center. The population distribution chart shows exceptional evenness throughout the greater part of the city. Greenville, on the whole, would seem to be an orderly city, with much of the groundwork of good planning already laid.

Under the direction of Ladislas Segoe, Planning Consultant, a Comprehensive City Plan has been drawn up "to guide, and in some measure control, both public and private improvements and developments." Because of the inherent soundness of the city, no very striking recommendations have been made. Zoning, subdivision control and building code adoption are proposed; "an organized, community wide program to encourage and promote the repair and modernization of older or substandard dwellings and high standards of maintenance of all structures . . . would seem highly desirable"; a plan of thoroughfares and highways is proposed; construction of several new schools, recreation areas and parks, and a number of public buildings. Most elaborate proposal is a civic center.

CALIFORNIA

Parks, Beaches and Recreational Facilities for Los Angeles County. Los Angeles 7, Calif. (2324 S. Figueroa St.), The Haynes Foundation, 1945. 8½ by 11 in. 18 pp. 10 cents.

Coordinated Public Works for Metropolitan Los Angeles. By George W. Bemis. Ibid. 6 by 9 in. 26 pp. 10 cents.

The first of these two pamphlets is a report by the County Citizens Committee on Parks, Beaches and Recreational Facilities. It describes the existing facilities and specifies the need for additional facilities.

The second booklet is a proposal for a "Public Works Review Board" with representation of federal, state, country and municipal agencies, whose job it would be to review all projects of a region-wide importance and advise the interested agencies on coordination of their proposals in timing and location.

BOSTON

In Which We Live. Annual Report of the Boston Housing Authority, 1944–1945. Boston 6, Mass. (10 Post Office Sq.), 1945. 8¼ by 11¼ in. 36 pp. illus.

The Boston Housing Authority, this report shows, has constructed to date eight developments and has two further developments on its schedule. The success of the existing projects is described and illustrated; the need for further building is graphically presented. The Authority is fully aware of the gigantic problem it faces, and it is striving valiantly to keep what it has gained through good management and careful maintenance. To increase efficiency and keep costs as low as possible, the Authority is gradually turning over to its own staff much of the repair work, including all exterior painting.

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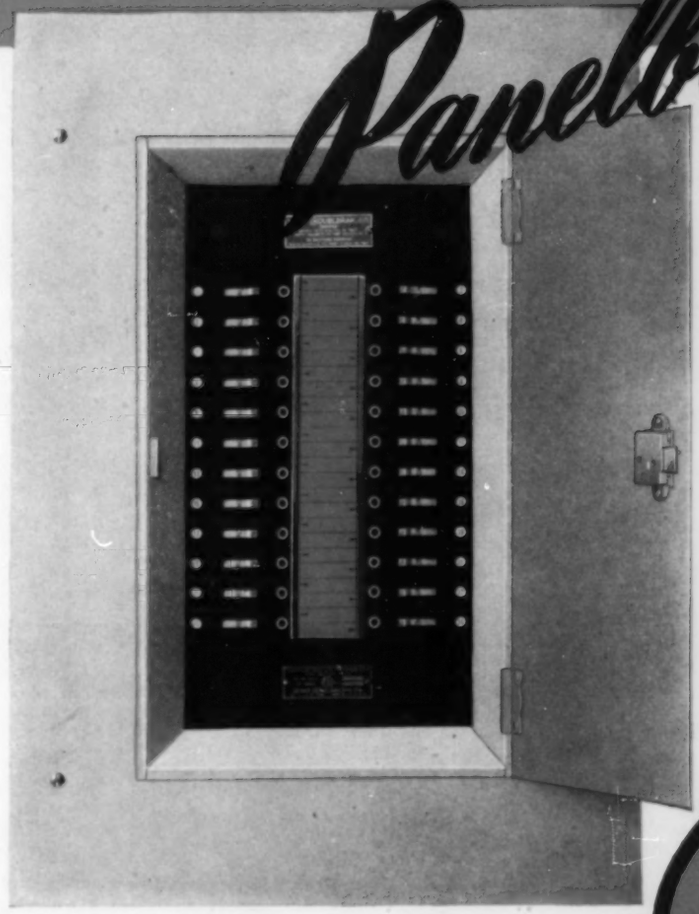

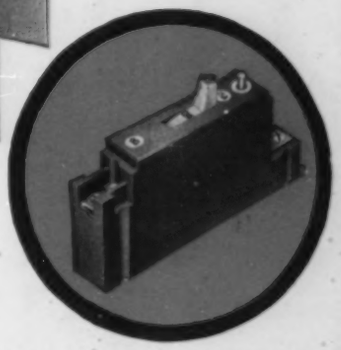

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 (*Continued from page 22*)

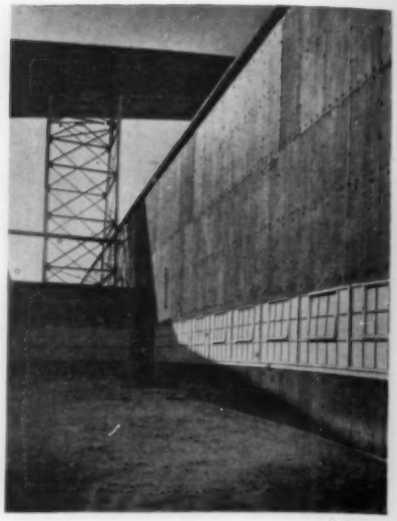
DRAFTING TABLES

Two new adjustable *Work-Flow* tables — a *Tilt-Top Work Table* and a *Drafting Table* — are designed to provide the greatest possible utility and comfort for the tabletop workman.

The drafting table can be quickly adjusted in height and angle; storage space is provided for three extra boards and large drawers to accommodate working materials. The work table may be adjusted in height from 28¼ to 38¼ in. for comfort of the operator in a sitting or standing position, and the top may be tilted from a level position to any angle up to 20°. Both tables are finished in dull green. Work Flow Equipment Co., 207 Wood St., Pittsburgh 21, Pa.

ROOFING METAL

A protected metal for roofing and siding on industrial and agricultural buildings consists of flat, corrugated or V-crimp steel sheets, the surfaces and edges of which have been treated with *Plastipitch*, a compound which provides permanent adherence to metal at low as well as high atmospheric temperatures and protects the base from rusting, corrosion, salt air and the effects of chemical fumes. After the Plastipitch coating, the sheets are provided with additional surfaces to give extra protection. The material is said to be suitable for gutters, ventilators, flashings, ducts, etc., as well as for roofing and siding. Koppers Co., Inc., Tar and Chemical Division, Pittsburgh, Pa.



A protected metal for roofing and siding

NICKEL-LINED PIPE

The inside of steel pipe can be electroplated with corrosion-resisting nickel or other metals by means of the new *Bart Lectro-Clad Process*, which develops a smooth, ductile, pore-free nickel deposit fully adherent to the base metal. It can be applied to pipe or tubing up to 18 in. over-all diameter, in random lengths approximately 20 ft. The internally plated pipe can be welded, reduced and bent, hot or cold, without destroying any portion of the internal lining. Bart Mfg. Co., 227 Main St., Belleville 9, N. J.

SUPPLY INDICATIONS

Mahogany

First deliveries of Philippine mahogany since the war will be made in the summer of 1946 in the form of logs, providing shipping space is available, according to J. Raymond Peck, president of the Insular Lumber Co.

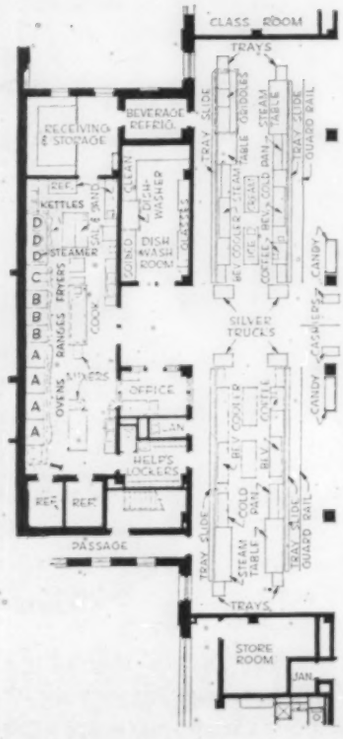
Rubber

Measured against prewar consumption and even greater postwar requirements, 19[illegible] will continue to be a "famine year" as far as natural rubber is con-

(*Continued on page 136*)

KITCHEN PLAN NO. 32: Thirty-second of a series of successful mass-feeding kitchen plans.

This kitchen plan in use at the huge Chicago Vocational School, now feeding 12,000 meals daily to 4,000 naval students, is an excellent example of the "specialized cooking tool" kitchen installation.



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1 No. 959 BLODGETT GAS-FIRED ROAST OVEN
(b) 3 heavy duty ranges
(c) 3 gas-fired deep fat fryers
(d) 1 vegetable steamer
2 stock kettles

Note: bake shop with two No. 982 BLODGETT BAKE OVENS not shown in plan

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High speed, "on time" production of heavy meals is easily accomplished when large capacity BLODGETT ROASTING EQUIPMENT is incorporated in the kitchen plan. The ovens shown in the layout above have a capacity of more than 1800 pounds of meat, and are used for production of fish, meats, and vegetables. For details and specifications of BLODGETT OVENS, consult your equipment house or write

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Reprints of this new series will soon be available to architects on request.

To assist architects, these . . .

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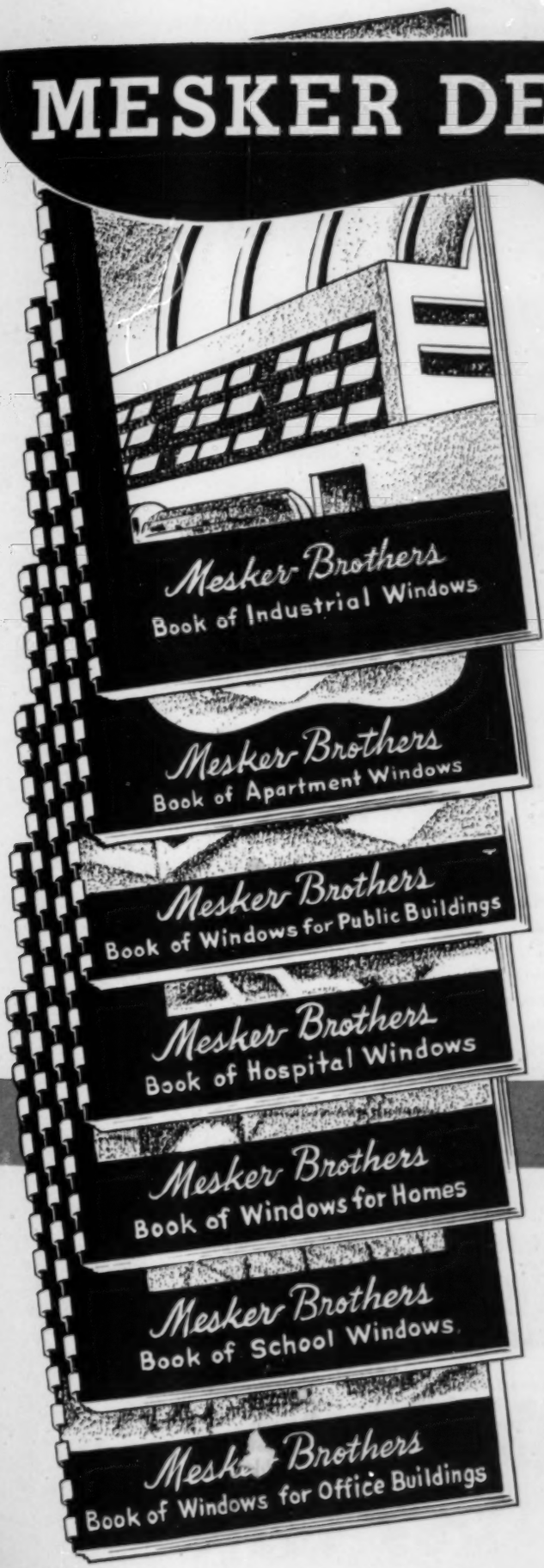

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cerned, the Rubber Manufacturers Assn. reports. High quality synthetic rubbers are in good supply.

Hardboard

The hardboard industry has experienced no stoppage of full output during the reconversion period, according to M. P. McCullough, president, Masonite Corp., and is now expanding manufacturing facilities to meet increasing demands. Because the stocks of wholesalers and dealers long have been depleted by war demands, however, it will be necessary for some time to allocate supplies, Mr. McCullough said. The end of 1946 "should find the situation improved."

REFILLABLE PENCIL

A *Draftsman's Refillable Pencil*, new on the market, has a clutch that holds the lead firmly in a non-slip rubber grip that prevents the nicking and scoring of lead which cause breakage. Especially designed for engineers and draftsmen, it

New pencil is long-barreled, refillable

has a long barrel permitting the use of any full-length standard drafting lead. The grip is knurled to provide a firm hold; an adjustable cap offers easy identification of the degree of lead used. Charles Bruning Co., 4654–8 Montrose Ave., Chicago 41, Ill.

STANDARDS

Minimum Design Loads

A new American Standard giving designers data on the loads a building can carry with safety has been approved by the American Standards Assn.

Known as the American Standard Building Code Requirements for Minimum Design Loads in Buildings and Other Structures (A58.1–1945), the standard answers such questions as how strong should floors and walls be made in factories, office buildings and theaters, and whether it is necessary in any particular part of the country to provide especially strong construction to resist wind pressures, to withstand earthquake shocks, and to prevent collapse of roofs under the load of winter snow. Copies are available from the American Standards Assn., 70 E. 45th St., New York 17, N. Y., at 50 cents a copy.

Gypsum Concrete

The American Standards Assn. also has completed revision of a standard covering design, construction and use of reinforced gypsum concrete. A new section relates to the position of the slabs of gypsum concrete in relation to the floor beams and roofs when they are installed by the suspension system. The main sections of the standard are: Materials, Strength of Gypsum Concrete, Allowable Stresses, Design, Inspection.

Copies of the standard, American Building Code Requirements for Reinforced Gypsum Concrete (A59.1–1945), are available from the A.S.A., 70 E. 45th St., New York 17, at 25 cents a copy.

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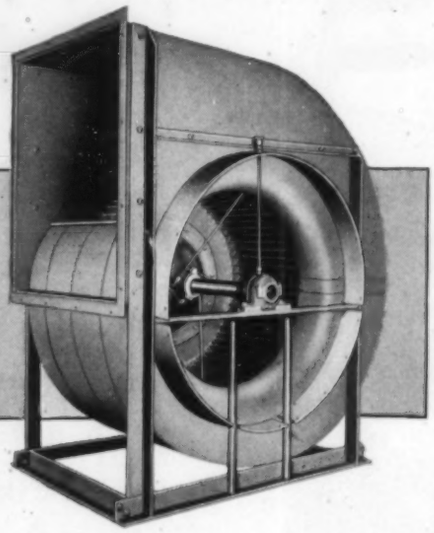

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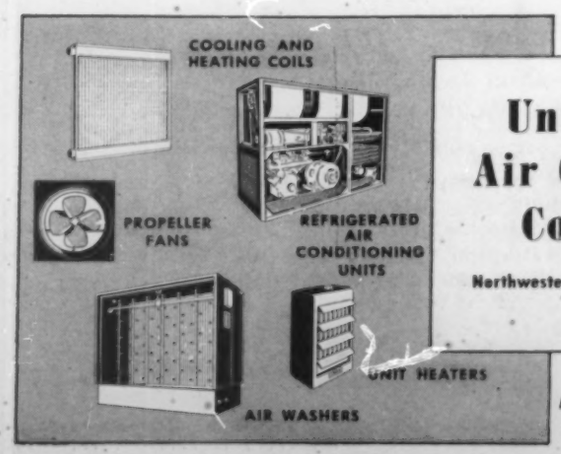

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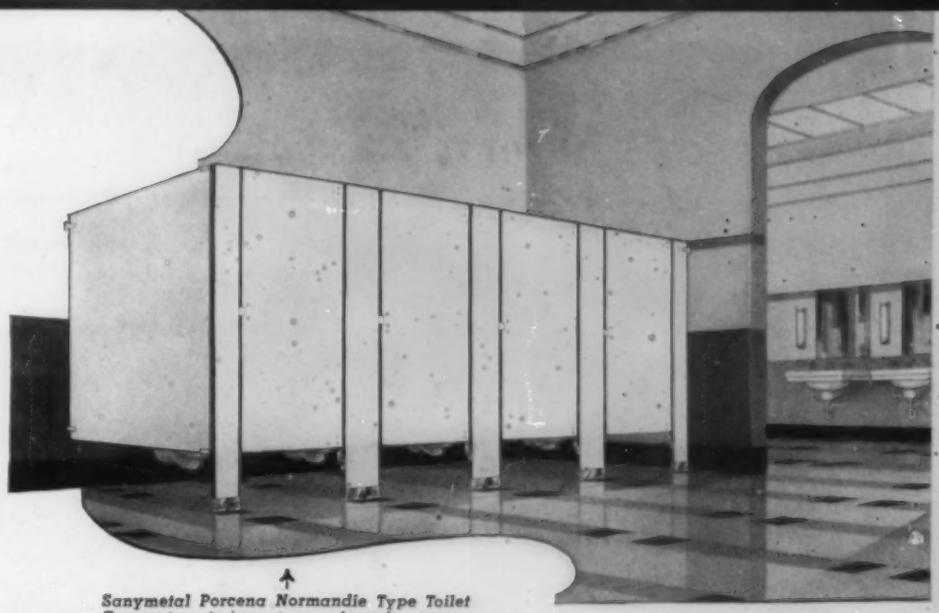
Provide Utmost Sanitation and Durability

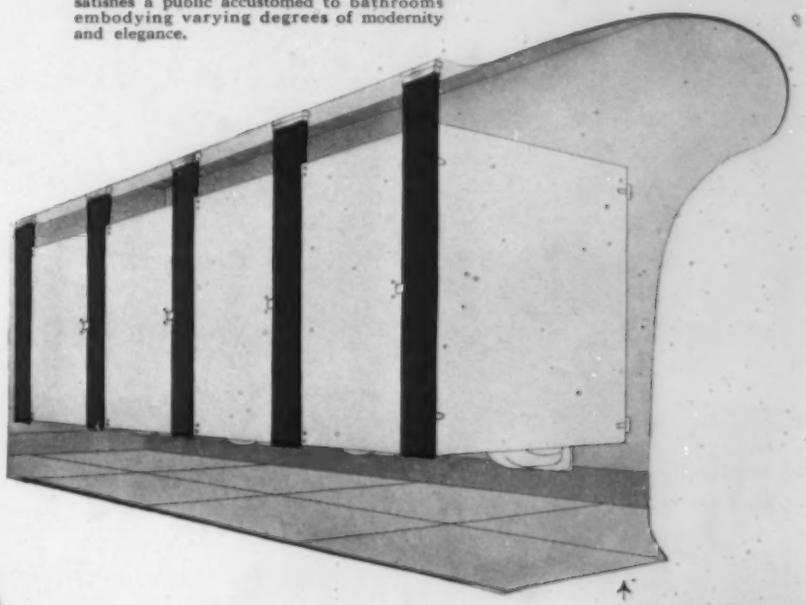
SANYMETAL PORCENA (porcelain on steel) Toilet Compartments elevate the toilet room environment into harmony with other modern environments of a building. These toilet compartments are fabricated of the ageless and fadeless material, porcelain on steel, which makes a glass-hard stainless material that always looks new, does not absorb odors, is moisture and rust proof and resists the corroding nature of ordinary acids. The glistening porcelain finish discourages defacement and can be wiped clean as easily as any glass smooth surface.

Sanymetal Porcena Toilet Compartments embody the results of over 30 years of specialized skill and experience in making over 68,000 toilet compartment installations. Ask the Sanymetal Representative in your vicinity (see "Partitions" in your phone book for local representative) for further information about planning suitable toilet room environments for modern school, industrial, and institutional types of buildings. Refer to Sanymetal Catalog 19B-5 in Sweet's Architectural File for 1945, or write for file copy of Catalog 83.

THE SANYMETAL PRODUCTS COMPANY, INC.
1689 URBANA ROAD • CLEVELAND 12, OHIO



Sanymetal Porcena Normandie Type Toilet Compartments impart a moderately streamlined effect to a toilet room environment. Streamlined design wedded to utility fulfills all requirements. Unadorned utility no longer satisfies a public accustomed to bathrooms embodying varying degrees of modernity and elegance.



Sanymetal Century Type Ceiling Hung Toilet Compartments are particularly appropriate for schools. They impart dignity, refinement, and cheerfulness to the toilet room environment. They make up into a rigidly fixed installation.

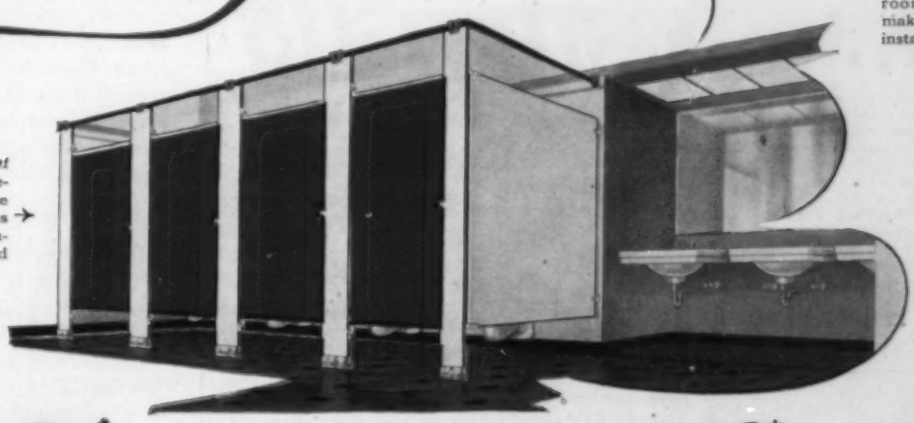
*Sanymetal**

"PORCENA"

(Porcelain on Steel) TOILET COMPARTMENTS

possess the natural structural strength of steel, not one sheet, but two 16-gauge sheets securely bonded on opposite sides of dense insulating core, strengthened by porcelain enamel (four layers on each sheet) which provides a non-porous, flint-hard, glass-smooth surface that is positively impervious to odors, acids and moisture.

Sanymetal Porcena Academy Type Toilet Compartments provide a certain distinctiveness. This type of partition is the only one in which all the dignity and distinctiveness of standard flush type construction, unmarred by posts, is appropriately combined with headrail.



Sanymetal Catalog 83 illustrates several typical toilet room environments.

*Sanymetal**

**Trade Mark Reg. U. S. Pat. Off.*

TOILET COMPARTMENTS

and Office Partitions

THE RECORD REPORTS (*Continued from page 16*)

Housing Platform Urged

A six-plank platform recommended for adoption by the United States Savings and Loan League sets forth that:

1. Slum clearance and housing are separate and distinct problems;
2. Both problems are local in character rather than national;
3. Private enterprise has, does and will provide better housing at lower cost than public housing;
4. Unsubsidized public housing is unsatisfactory as compared with privately built housing both as to social and economic qualifications;
5. Where subsidies are necessary for decent housing they should be provided at the individual instead of the community level;
6. The use of public funds for housing should be confined to research and statistical studies and for the acquisition of land for urban redevelopment as provided by law in various states.

BARBER-COLMAN

TEXAS RESTAURANT

This coffee shop in the Hotel Baker at Dallas was remodelled, redecorated, and modernized as shown in the picture above. New equipment included the attractive flush type VENTURI-FLO Ceiling Unit with standard lighting fixtures added. The size and spacing of these units was selected so as to provide draftless air distribution and uniform temperature throughout the room, for optimum comfort conditions and most pleasurable dining.

Venturi-flo

CEILING OUTLETS FOR GUARANTEED AIR DISTRIBUTION

Data based on complete tests enable us to recommend exactly the right outlet for any condition and GUARANTEE results. You are assured of uniform, properly diffused air of the desired temperature at specified level, with required air movement and elimination of hot, cold, or drafty areas. Use ENGINEERED AIR DISTRIBUTION — see your Barber-Colman representative.

BARBER-COLMAN COMPANY
1232 ROCK STREET • ROCKFORD, ILLINOIS

Chamber of Commerce Testifies

The National Chamber of Commerce has told the Senate Banking and Currency Committee that "less, rather than more, federal control over what is essentially a local activity is the prescription for housing relief." The National Chamber also pointed out that the housing shortage does exist in many communities but not, as claimed, in almost every community. In a statement by its board of directors the Chamber predicts no substantial volume of construction before next spring and summer, remarks that new building "can properly be removed from rent control with beneficial effects prior to the removal of such control on existing rental properties." Production and production and more production is needed, the Chamber stresses.

Government Agencies Busy

The Federal Public Housing Authority has issued orders to all its regional offices freezing further disposal of any movable war housing units under its jurisdiction except to house veterans and servicemen's families.

The Office of Price Administration took the limelight in New York in December with the announcement of advance approval of ceiling rentals on a 114-apartment project to be erected in White Plains, Westchester County. Approval was granted after the local Rent Office had reviewed the builder's plans, specifications, operating and maintenance costs, and surveyed comparable rental rates. An average monthly rent of $21 per room was approved. R. M. Dinsmore & Co., Inc., are the builders for the projects, scheduled to be ready for occupancy by late summer, 1946.

Slum Clearance Planned

Plans for completion of a slum clearance project in Schenectady, N. Y., through state-aided public housing have been approved by Herman T. Stichman, State Commissioner of Housing. He termed it an effective demonstration of state and municipal cooperation under Gov. Dewey's plan to help rehabilitate run-down sections of the state's cities.

OFFICE NOTES

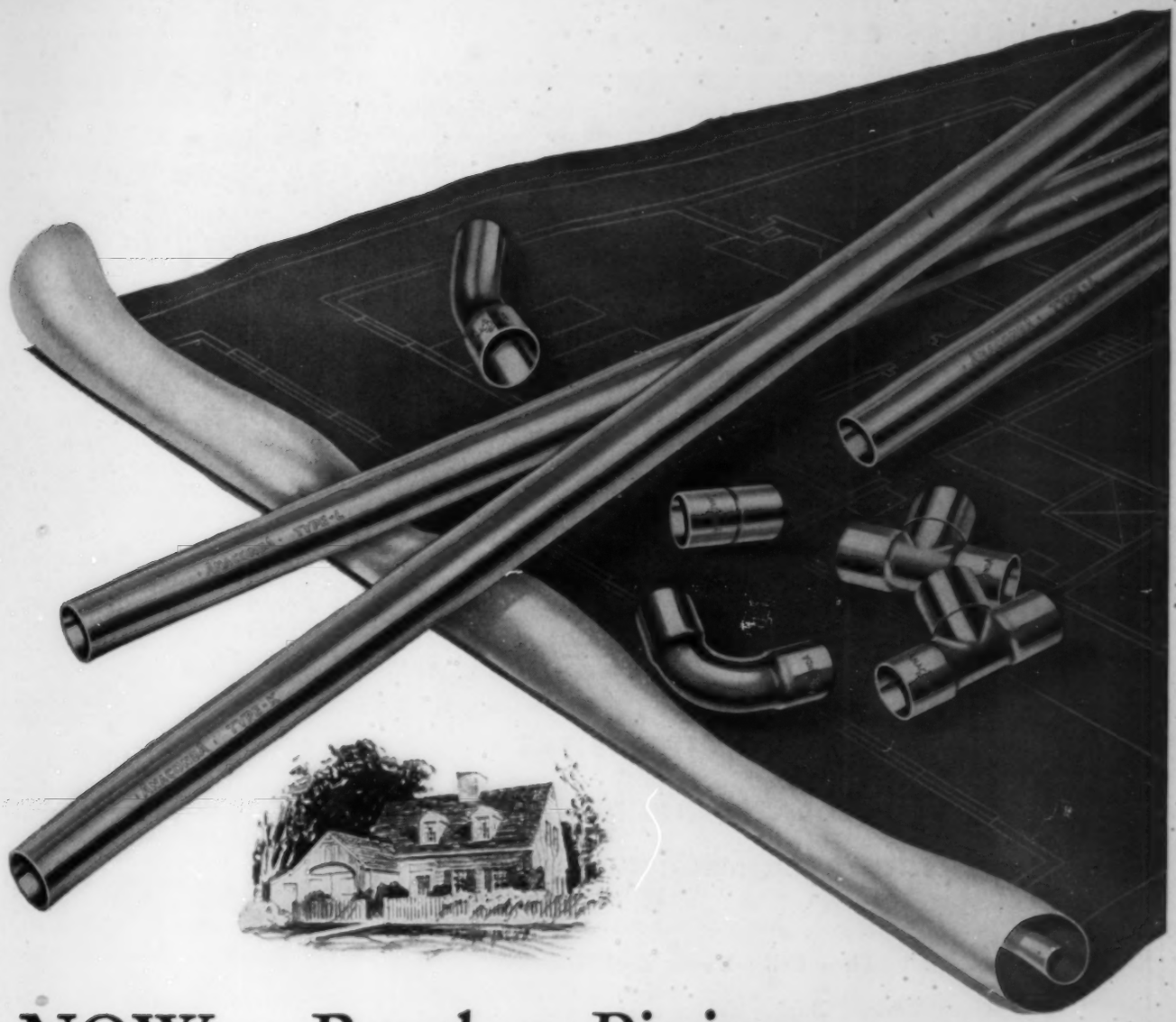
Offices Opened and Reopened

William F. R. Ballard, Architect, has resumed his practice at 123 E. 77th St., New York 21, N. Y.

Carroll & Daeuble, Architects (Edwin W. Carroll, A.I.A., and Louis Daeuble, Jr.), announce the opening of offices for the practice of architecture in Suite 355-57-59, First National Bank Bldg., El Paso, Texas.

Henry G. Markel, Architect, has resumed his practice at 236 W. Capitol St., Jackson, Miss.

(*Continued on page 140*)



NOW... Rustless Piping for even the *Smallest Home!*

TODAY, there is no reason why any new home, no matter how modest, should be equipped with water lines that rust. For Anaconda Copper Tubes assembled with Solder Type Fittings can be installed at a price competitive with rustable pipe.

Such a system provides a clean supply of rustless hot and cold water, and guards against trouble and premature piping replacement.

Anaconda Copper Tubes are made from specially deoxidized 99.9+% pure copper. They are furnished soft in sizes up to and including 1¼" in 30, 45 and 60-foot coils; also hard and soft in 20-foot straight lengths. Larger sizes are supplied hard or soft in 20-foot straight lengths only.

In addition to their use as water lines, Anaconda Copper Tubes provide long, economical service for heating lines, garden and lawn sprinkler systems and as tank-to-oil-burner, bottled gas and other connections.

For detailed information, write for Publications B-1 and C-2.

ANACONDA

Anaconda

COPPER TUBES

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

THE RECORD REPORTS (*Continued from page 138*)

MacKie and Kamrath, Architects (Fred J. MacKie, Jr., A.I.A., and Karl F. Kamrath, A.I.A.), have reopened their offices following over three years in the Army. Temporary address: 2500 River Oaks Blvd., Houston, Texas.

Verner B. McClurg, Architect, and Henry M. Hesse, Office Manager, announce the opening of the office of McClurg and Hesse, 634 N. Central Ave., Glendale 3, Calif.

Samuel Zouri Moskowitz, A.I.A., recently discharged from active duty with the Armed Forces, has reopened his offices at 1201 Miners Bank Bldg., Wilkes-Barre, Penna.

Kenneth G. Paxton, Architect, recently discharged from the Armed Forces, has reopened his offices in the Board of Trade Bldg., Wheeling, W. Va.

T. Trip Russell, A.I.A., announces the reopening of his architectural office at 2301 S. Miami Ave., Miami 36, Fla.

Lt. Com. Eldredge Snyder announces that he has been released from active duty in the United States Naval Reserve and has reestablished his practice as Architect at 101 Park Ave., New York.

Stewart JAIL and PRISON EQUIPMENT

COVERS ALL REQUIREMENTS

from a village lockup to a federal penitentiary

Grating and Plate Cells; Doors; Lock and Locking Devices; Bunks; Tables; Seats; Iron Stairways, and all modern jail equipment. Our engineering staff will be glad to assist architects in the development of plans for new construction or remodeling, and furnish, without cost or obligation. complete information on any project irrespective of size. ¶ You are cordially invited to avail yourself of the technical facilities offered by the Stewart jail and prison engineering department.

THE STEWART IRON WORKS COMPANY, INCORPORATED

1377 Stewart Block - - Cincinnati, Ohio

Designers and Builders of "Jail and Prison Equipment Since 1886"

New Addresses

The following new addresses have been received:

Oscar I. Emerson, Architectural and Appraisal Service, P. O. Box 178, Brunswick, Maine.

Shelgren & Whitman, Architects (Olaf William Shelgren and James Spaulding Whitman), 507 Franklin St., Buffalo 2, N. Y.

Firm Changes

Phelps Barnum, for 3½ years an architect for Pan American World Airways, has returned to private practice and has formed a partnership with W. Stuart Thompson. Address: 125 E. 46th St., New York, N. Y.

Will Alban Cannon, Architect, announces the formation of an associateship with Charles Irwin Thiele, Architect, Anthony Betz, Architect, Will Alban Cannon, Jr., B.S.A., and Thomas H. McKaig, Engineer, under the firm name of Will Alban Cannon and Associates, Architects-Engineers. Address: 2637 Main St., Niagara Falls, N. Y.

Charles A. Carpenter and C. Storrs Barrows announce the formation of a partnership for the practice of architecture under the firm name of Carpenter and Barrows, Architects, with offices at 618 Reynolds Arcade, Rochester, N. Y.

Faulkner and Kingsbury, Architects, announce the following admissions to membership: John Warren Stenhouse, partner; Ben Hopson Dyer, associate, under the new firm name of Faulkner, Kingsbury and Stenhouse. Address: 917 Fifteenth St., N. W., Washington 5, D. C.

Frederick R. Louis and A. Read Henry, having returned from military service, announce formation of the partnership of Louis & Henry, Architects, with offices at 1271 Starks Bldg., Louisville 2, Ky.

Louis E. McAllister and Douglas G. Braik announce an association for the practice of architecture, with offices in the Bulletin Bldg., Philadelphia 7, Penna.

Walter Dorwin Teague, Industrial Designer, announces that Marc Thompson has joined his organization to advise on airport terminal facilities and act as consultant to communities and others planning airports. Mr. Thompson was formerly chief of Building Design Service of the Civil Aeronautics Administration, where he initiated the architectural service of CAA and wrote the manual "Airport Buildings," soon to be published.

J. Binford Walford announces that O. Pendleton Wright will be associated

(*Continued on page 142*)

S. S. KRESGE STORE, BOSTON, MASS.

Fixture Mounting Height	15 ft.
Watts per Sq. Ft.	2.5
Average Illumination	24 foot-candles
Bottom Lens Panels Code No. 90816, $8\frac{1}{2}''$ x 48″	
Opal Diffusing Side Panels Code No. 90772, $3\frac{1}{16}''$ x $23\frac{1}{16}''$	

CORNING FLUR-O-GUIDES PROVIDE

High Level Illumination on Display Areas

The fluorescent installation in the S. S. Kresge Washington Street store in Boston is an example of how Corning Flur-O-Guides, used in conjunction with Corning diffusing side panels, put light to work for the user. Here, Flur-O-Guide Fresnel type lenses provide maximum illumination on the counters and on the merchandise displayed.

High levels of illumination are obtained on the sales counters, without eye-fatiguing glare in the direct line of sight. Diffusing side panels have been made a part of the fixtures which cut down excessive brightness and provide for good general illumination.

Here is just one example showing how the complete line of Corning Lightingware has been designed to meet the requirements of illuminating engineers and architects. High quality plus engineering features and attractive design distinguish Corning Lightingware and provide an ideal method of fulfilling your interior lighting requirements. When planning lighting applications, consider the use of Corning Lightingware.

Write for a copy of "Corning Lighting Data" illustrating the complete line of the scientifically designed Corning Flur-O-Guide lenses and diffusing panels and explaining how engineered lighting can be applied to your lighting problems. Address Lighting Sales Dept. AR-2, Corning Glass Works, Corning, New York.

Whatever Your Lighting Problems . . . Specify Corning Engineered Lightingware

CORNING LENSES AND PANELS
Are Available for
GENERAL LIGHTING
SUPPLEMENTARY LIGHTING
LOCALIZED LIGHTING

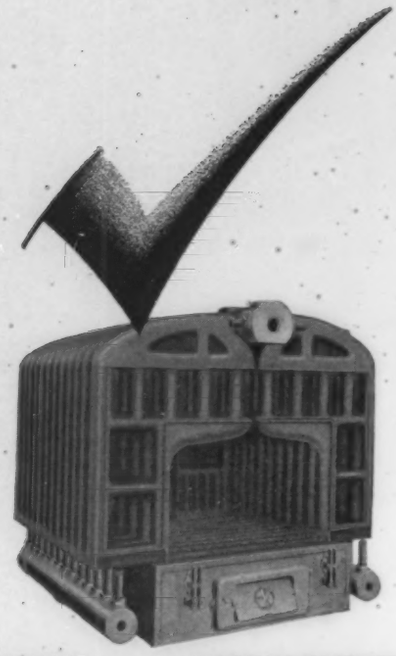
For Special Effects in Commercial Interior Lighting
STORES SCHOOLS
THEATRES MUSEUMS
BANKS HOTELS
OFFICES HOSPITALS

Recommended for Industrial Plant Lighting, General Illumination and Localized Lighting
INDUSTRIAL PLANTS PRIVATE AND
ASSEMBLY LINES GENERAL OFFICES
INSPECTION AREAS ELECTRICAL
LABORATORIES INSTRUMENT
DRAFTING ROOMS PANEL BOARDS

"CORNING" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

CORNING *means* Research in Glass

Corning Engineered Lightingware
BRAND



NEW and IMPROVED

"42" Smith

BOILER

IS FIRST CHOICE . . . WHEREVER HEATING DEMANDS ARE HEAVY

Here is an improved big cast iron boiler for that heavy duty job . . . whether it be factory, hospital or public building. Known to engineers and contractors as "tops" for use with solid fuels, whether hand or stoker fired, the 42 Smith has recently been redesigned to effect an even further improvement in its already high standard of performance. Check the features of this modern efficient unit against the requirements of that tough job you're figuring now. We think you'll find the 42 Smith a natural!

- ✓—*Water tube construction* promotes efficient water circulation, fast steaming.
- ✓—*Plenty of heating surface.* Even more prime surface has been added in the new model.
- ✓—*Made of rugged cast iron* for long service, low maintenance.
- ✓—*Header type construction* minimizes possibility of mid-season breakdown.
- ✓—*Properly proportioned* for stokers or other automatic firing devices.
- ✓—*Convertible* from one fuel to another both easily and inexpensively.

Write for free catalogue

THE H. B. SMITH Co. Inc.
WESTFIELD, MASS.
Offices and Sales Representatives in Principal Cities

THE RECORD REPORTS

(*Continued from page 140*)

as a co-partner in the general practice of architecture under the firm name of J. Binford Walford, O. Pendleton Wright, Architects. Address: 103 E. Cary St., Richmond 19, Va.

ELECTIONS

Fontainebleau Association

At an executive meeting of the Fontainebleau Association the following officers were elected: president, Charles Z. Offin; honorary president, Mrs. Ernest Peixotto; 1st vice president, Sidney Waugh; 2nd vice president, Robert Beverly Hale; treasurer, Allen Townsend Terrell; secretary, Mrs. Leila G. Sawyer; French coordinator, Mme. Natacha Carlu; advisory member, Miss Mary Turlay Robinson.

The Association shortly will issue its Bulletin, and all former students are asked to send their addresses to the secretary, Mrs. Leila G. Sawyer, 2 Beekman Pl., New York City.

U. S. Savings and Loan

Henry P. Irr, president of the Baltimore Federal Savings and Loan Association, was elected president of the U. S. Savings and Loan League at a recent meeting. He succeeds W. M. Brock, of Dayton, Ohio.

American Standards Association

Henry B. Bryans, executive vice president and director of the Philadelphia Electric Co., was unanimously reelected to serve a third term as president of the American Standards Association. Frederick R. Lack, vice president and manager of the Radio Division, Western Electric Co., Inc., was elected vice president.

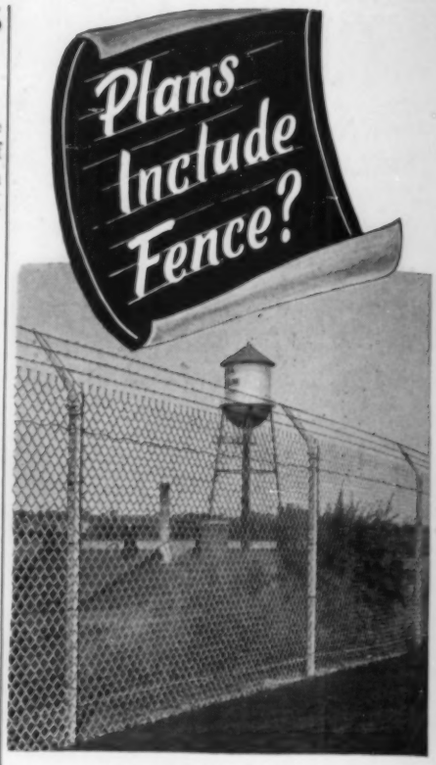
COLLEGE NOTES

Extension Courses Offered

Recognizing a current critical shortage of manpower in the architectural fields, the University of California through University Extension is completing arrangements in Los Angeles for a sequence of special courses to relieve the situation.

Endorsed by the Southern California chapter of the A.I.A., the training program, which opened last month, is designed to meet the training problem on three fronts. It will retrain personnel trained in related fields during the emergency; offer a review for those trained in architecture who have been dissociated from the field for a period of time; and prepare those already employed in an architect's office to qualify for positions

(*Continued on page 144*)



Get this book for A. I. A. File 14-K

"ANCHOR PROTECTIVE FENCES" is both a catalog and a specification manual. Shows many types and uses of Anchor Chain Link Fence . . . pictures installations for many prominent companies and institutions . . . contains structural diagrams and specification tables.

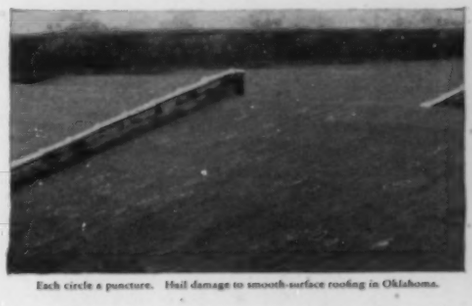
Also shows important and exclusive Anchor features: *Deep-Driven Anchors*, which hold the fence permanently erect and in line in any soil; *Square Frame Gates*, amazingly free from sagging and warping; *Square Terminal Posts* and *U-Bar Line Posts*, which increase strength and durability.

Just ask for Book No 110. You'll find it both useful and informative. We'll be glad to send a free copy. Address: Anchor Post Fence Co., 6600 Eastern Ave., Balto., 24, Md.

Anchor Fence

Nationwide Sales and Erecting Service

Why an Insurance Group likes tar and gravel roofs



Each circle a puncture. Hail damage to smooth-surface roofing in Oklahoma.

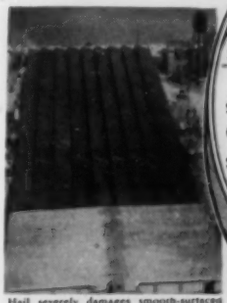
Close-up of typical hail damage.

Which Roof Resists Hail Best?

Gravel roofs much more resistant than smooth-surface. From experience covering large areas of both types exposed in Factory Mutual plants, comparative hail damage in 10 years (1935-1944) is as follows:

SMOOTH-SURFACE	115 Losses	$138,000
GRAVEL-COVERED	3 Losses	[illegible]

COULD your factory roofs resist a bombardment of egg-sized hailstones? It depends on the type of roofing. Last March, at the Watervliet Paper Company in Watervliet, Michi-



Hail severely damages smooth-surfaced sawtooth roof in background. No damage to tar-gravel roof in foreground.

gan, a [illegible] the roofing [illegible] punctured roofing had [illegible] with cap sheets. But blis[illegible]ain developed, and the damage w[illegible] repeated. *Tar and gravel roofs were unharmed.*

In May, another hailstorm caused similar damage at the Wagner Electric Company in St. Louis, Missouri. The stones were as large as golfballs, and the [illegible]listered smooth surface coverings on [illegible] buildings were punctured. *Here [illegible]in, gravel-covered roofs were unharmed.*

[illegible] August Denver experienc[illegible] severe hailstorm [illegible]

hailstones fell so fast that they piled up three inches deep in the yard of the American Manganese Steel Company plant. Smooth-surface roofing on six buildings was damaged and many windows were broken.

In practically all these instances, rain leaked through the damaged roofing, wet down machinery and stock, and delayed production.

With smooth-surface roofing, particularly if blisters and buckles are [illegible] severe hail damage can be ex[illegible] capping damaged roofs is [illegible]s measure which merely [illegible] a repetition in the [illegible]ranteed tar and [illegible]s decided ad[illegible]ooth hail and [illegible]commended [illegible]r repairs. [illegible]ing roofs [illegible]z; for [illegible]ar and [illegible]en de-

[illegible]oors from a doorstep in [illegible] record storm last August.

This clipping is from the Factory Mutual Record . . . a publication issued by the Associated Factory Mutual Fire Insurance Companies.

Tar and gravel roofs have shown a disregard for weather . . . they have resisted damage by rain or snow . . . and, as testified in this article, have proved their effectiveness in severe hailstorms. Factory Mutual says that by recommending tar and gravel roofs, they are fulfilling their function of giving the best engineering advice to their policyholders.

If you want this kind of roof performance, specify Koppers Old Style Pitch and Approved Tarred Felt. —Koppers Company, Inc., Tar and Chemical Division, Pittsburgh 19, Pa.

KOPPERS
Koppers coal tar pitch roofing
KOPPERS
Koppers coal tar pitch waterproofing

Refer to your Sweet's Catalog or write us for complete specifications

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THE INDUSTRY THAT SERVES ALL INDUSTRY